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ABSTRACT

This report discusses a project that compared the rate of use of assistive technology (AT) services and devices by American Indians and Alaska Natives with that of other ethnically diverse groups, identified barriers, and examined consumer satisfaction regarding AT. The project drew on four sources of data: the Rehabilitation Services Administration (RSA) 1998 national RSA-911 annual reports and the 1994-95 National Health Interview Survey (NHIS); questionnaires sent to American Indians who had used or were in need of AT; and participants in an on-line assistive technology course. Based on data from the 1998 RSA-911 reports, American Indians and Alaska Natives participating in vocational rehabilitation programs used AT devices at lower rates than Whites and Asians but at higher rates than Blacks, and received AT services at lower rates than other races. Based on the NHIS data, American Indians, Eskimos, and Aleuts used mobility devices and braces at higher rates than other races; however, they used hearing aids at significantly lower rates than Whites. Responses from 15 American Indians and Alaska Natives indicated traditional information dissemination strategies on AT were ineffective in reaching these populations. In addition, respondents believed financial concerns compromised the affordability and availability of AT services. (Contains 45 references.) (CR)

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Improving Employment Outcomes among American Indians through Assistive Technology: A Preliminary Study

Final Report

2002

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Table of Contents

List of Tables iv

Acknowledgments v

Project Advisory Committee Members vi

Summary vii

INTRODUCTION 1

- Summary of Relevant Literature 3
  - The Digital Divide and Access to Assistive Technology 6
    - Background 6
    - The Evidence 8
  - Review of Existing Databases 10
    - Current Population Survey 10
    - RSA-911 Case Service Reports 10
    - National Health Interview Survey (NHIS) 11

METHODOLOGY 11

- Research Hypotheses 11
- Research Populations 12
  - Consumer Survey 12
    - Research Population 12
    - Survey Instrument 13
    - Procedure 13
  - Internet Courses on AT for Service Providers 13
    - Research Population 13
    - Procedure 14
  - Analysis of RSA-911 and NHIS Data 15

RESULTS 16

- RSA-911 Data Analysis 16
- NHIS Data Analysis 17

Consumer Data Analysis 19
Analysis of Demographic Information 20
Analysis of Data Regarding AT Devices 24
Analysis of Data Regarding AT Services 28
Making, Repairing and Maintaining AT Devices 31
Participation in Activities Outside the Home 32
Analysis of Funding for AT Devices 36
AT in American Indian Culture 37
Results from the On-line AT Courses 38
DISCUSSION and CONCLUSIONS 40
Rate of Receiving AT Services and Devices 41
Barriers to Receiving AT Services and Devices 42
Comparison of Results with other Studies 43
Conclusions 45
Recommendations 46
REFERENCES 49
Appendix A: Questionnaire 55
Appendix B: UAP 505 78

List of Tables

Table 1 1998 VR Consumer Use of AT Devices and AT Services 17
Table 2 1994-95 National Health Interview Survey AT Device Usage 19
Table 3 Disabilities, Impairments, or Chronic Illnesses of Respondents 21
Table 4 Housing and Utilities of Respondents 22
Table 5 Average Number of Hours of Assistance in Activities of Daily Living 22
Table 6 Highest Level of Formal Education 23
Table 7 Employment Status and Employment Services 23
Table 8 How Often Respondents Used AT Devices 28
Table 9 Types of AT Service(s) Needed but Unavailable in Different Environments 29
Table 10 AT Services Received by Respondents in the Past Year 30
Table 11 Degree of Awareness of Available AT Devices and Services 31
Table 12 Provider of AT Services 31
Table 13 Frequency of Participation in Activities Outside the Home 33
Table 14 Unmet and Met AT Needs 34
Table 15 Areas of AT Needs 35
Table 16 Control Over Selection of AT for Purchase 36

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Summary

The purpose of this project was to compare the rate of use of assistive technology (AT) services and devices by American Indians and Alaska Natives with that of other ethnically diverse groups, identify barriers to use of services, and examine consumer satisfaction regarding AT. Although AT can improve prospects for successful employment outcomes, at the time this research was begun existing research literature had not discussed the utilization of such services by American Indians and Alaska Natives. Research was needed to describe the patterns of use of AT among ethnically diverse groups such as American Indians and Alaska Natives, investigate why these patterns exist, and describe the barriers to use.

This project drew on four sources of data: data from the Rehabilitation Services Administration (RSA) 1998 national RSA-911 annual reports and the 1994-1995 National Health Interview Survey (NHIS); data from questionnaires sent to American Indians who had used or were in need of AT; and data from participants in an on-line assistive technology course. Based on data from the 1998 RSA-911 annual reports, American Indians and Alaska Natives participating in vocational rehabilitation (VR) programs used AT devices (ATDs) at lower rates than Whites and Asians /Pacific Islanders but at higher rates than Blacks, and received AT services at lower rates than other races. Based on data from the NHIS, American Indians, Eskimos, and Aleuts used mobility devices and braces at higher rates than other races and ethnic groups surveyed. However, American Indians, Eskimos, and Aleuts used hearing aids at significantly lower rates than Whites.

Responses from 15 American Indians and Alaska Natives who returned the project questionnaire indicated that newsletters, newspaper advertisements, TV commercials, vendors, training, and conferences about AT did not effectively reach American Indians and Alaska Natives with information about AT. In addition, respondents recognized that socioeconomic factors, with money at the top of the list, compromised the affordability and availability of AT services to American Indians and Alaska Natives with disabilities. Among devices and services that respondents needed but could not obtain, the largest number of respondents listed AT devices and services for work and work training and for getting around.

Finally, 15 VR counselors (12 of whom were American Indians themselves) working with American Indians and Alaska Natives who took the on-line AT course offered by the project team listed the following problems related to taking web courses: lack of access to the Internet, inconvenient access to computers, computers that were not always available during the dates and times students were able to work on the course, inadequate servers, unfamiliarity with the Internet, limited computer skills, and insufficient time.

Based on the results of this research, the investigators offered the follow recommendations:

1. Annual analysis of RSA-911 data to monitor trends in the use of AT services and devices by American Indians and Alaska Natives, expanded to include the effectiveness of those services as measured by Closure Status.
2. Training for VR counselors regarding screening and referral for hearing impairments. This might include providing clients and their families with information about the availability of services and devices for people with hearing impairment. If hearing aids are provided, counselors need to ensure (in Native language as appropriate) that the audiologist will provide clear instructions on the use and maintenance of hearing aids, such as what to do when the hearing aid does not seem to work (e.g., how to check battery and replace battery, how to keep air channel open and clean out any earwax).
3. Training for VR counselors about how to consider AT for their clients, given the resources available in the client's setting.
4. Training for VR counselors on researching for comparable benefits for AT, including purchase in a timely fashion with a warranty, preferably with a local vendor.
5. Training for tribal VR counselors in how to bridge the digital divide in order to provide more effective AT services and devices to their consumers. This training would include general information about how to use computers and the Internet,

and also how to use the Internet to find out about products and services their clients need. The training would also include information about AT and how to help their clients obtain, maintain, and repair the most common AT devices and services, such as mobility aids, hearing aids, and braces.

6. Advocacy efforts are needed with Tech Act projects and Independent Living Centers to increase their awareness of the AT needs of American Indians and Alaska Natives with disabilities.

Areas of needed future research include:

1. Follow-up research is needed on why 27% of the survey respondents were unable to get AT devices and services for "work and work training" when they needed it. These respondents were probably more likely than most American Indians and Alaska Natives to have received VR services, so why was "work and work training" an unmet need, to a greater extent than in Parette and VanBiervliet's (1990) survey? Similarly, follow-up research is needed on what the "getting around" services were that they could not obtain.

2. A comparison of our results with data about American Indians and Alaska Natives in other databases based on probability sampling is needed, in order to obtain more reliable information about rates of use of AT services and devices by American Indians and Alaska Natives.

3. A larger follow-up survey with a sample size of more than 100 respondents is needed in order to obtain a better assessment of the AT needs of American Indians and Alaska Natives.

4. A survey of counselors in Independent Living Centers, Tech Act, and state and tribal VR programs that serve American Indians and Alaska Natives who use or need AT services or devices is needed to determine their degree of awareness about the AT needs of these consumers and the extent to which they are providing the needed services.

Improving Employment Outcomes among American Indians through Assistive Technology: A Preliminary Study

Assistive technology (AT) is an important tool for successful vocational rehabilitation (VR) for many persons with disabilities, yet about half of American Indians with disabilities live in remote areas where assistive devices may not be available or cannot be properly maintained. Thomason (1994) identified two types of barriers to providing effective AT services to Native Americans: barriers generic to serving any rural population, and barriers unique to Native Americans due to cultural differences when compared with other U.S. population groups and across the various American Indian nations.

Modern technology can save lives, cure disease, increase productivity, and connect people globally. But it can also alienate, isolate, and dehumanize people. This dual quality of technology is illustrated by the availability of satellite dishes, enabling people to receive audiovisual information electronically but possibly at the price of emphasizing impersonal, passive learning over personal interaction and active learning. Family relationships can change as first television and now computers become the center of attention; patterns of interpersonal communication and relationships may change. In this way, the values articulated by the producers of TV programs can have an impact on people even in the most rural areas, and technology can become another means by which mainstream society influences Native peoples.

Problems often encountered in serving rural populations include poverty, isolation, and lack of awareness about available services. Cultures unique to American Indians and Alaska Natives may include special beliefs about health and disability, extended family structures, lifestyles, and language. Very little work has been done to investigate how these cultures affect the utilization of AT services, according to Thomason (1994).

Given the large quantity of general information on AT, researchers at the American Indian Rehabilitation Research and Training Center (AIRRTC) concluded that there was a lack of information about the use of, accessibility to, and success with AT for employment-age American Indians with disabilities. Basic questions were still not answered, such as the rate of use of AT services by different races or ethnic groups, the degree of satisfaction that American Indian consumers have with AT services, and the extent to which the use of these services has improved employment outcomes among American Indians. A usable database of information was therefore needed in order to improve services to and employment outcomes for American Indians with disabilities. Such a database could provide service providers, independent living centers, and employers with information about the AT needs of American Indians, including information on issues such as rural versus urban residence, types of disabilities, socioeconomic status, and generational differences.

The purpose of this project was to compare the rate of use of assistive technology (AT) services and devices by American Indians and Alaska Natives with that of other ethnically diverse groups, identify barriers to use of services, and examine consumer satisfaction regarding AT. Although AT can improve prospects for successful employment outcomes, at the time this research was begun existing research literature had not discussed the utilization of such services by American Indians and Alaska Natives. Research was needed to describe the patterns of use of AT among ethnically diverse groups such as American Indians and Alaska Natives, investigate why these patterns exist, and describe the barriers to use.

Summary of Relevant Literature

In recent years there has been a growing interest in the applications of AT. Assistive technology devices (ATDs) have helped individuals with disabilities to communicate, move about and control features of their environment, engage in leisure activities, and participate in educational and vocational activities (Cook & Hussey, 1995; Church & Glennan, 1993; Lane & Mistrett, 1996; Lazarro, 1993; Mann & Lane, 1992). Assistive devices have also improved the educational performance of children with severe disabilities (Lindsey, 1987) and have helped adolescents to transition into meaningful and productive employment activities (Moon, Inge, Wehman, Brook, & Barcus, 1990).

Much research has focused on the use of AT with children, students, and the elderly (ARC, 1994; Cassatt, 1992; Gay, Lane, & Williams, 1995; Gay, 1996; Gitlin, 1995; National School Boards Association, 1997; Parette, 1995; Trachtman & Pierce, 1995). Information also exists on the use of AT in VR (Institute on Rehabilitation Issues, 1990; Flynn & Clark, 1995; Langton & Lown, 1995). For example, more people using VR services in the Pacific Basin appear to have been successfully rehabilitated (Status 26) in fewer days and at less cost when using AT than when not using AT (Galea'i, Yamanda, & McFarlane, 1999); these results, however, were not statistically significant. Furthermore, in surveys about AT use, Parette and VanBiervliet (1990) reported that the response rate was poor unless return envelopes were provided.

Although there are documented benefits to providing AT services to VR clients, even most vocational evaluations continue to involve AT only in a limited way (Flynn, 1994). For American Indians as well as for the general population, the limited use of AT in VR might be due to factors such as lack of availability as well as to language and other cultural factors. To find out what those factors might be, Schacht and Gallagher (summarized in Schacht, 1996; Schacht & Gallagher, 1999) reviewed data from a series of community-based needs assessments and follow-up analyses conducted by the AIRRTC in four metropolitan areas and two rural areas in the early and mid-1990s. In those studies, 588 American Indians with disabilities were interviewed in Denver (N = 100), Minneapolis-St. Paul (N = 127), Dallas-Ft. Worth (N = 150), Houston (N = 155),

southern Arizona (N = 24), and northwest New Mexico (N = 32). About 90% of these were urban residents. In each set of interviews, respondents were asked to identify the assistive devices they used or needed. Many respondents used more than one device. The most common assistive device used, by far, was eyeglasses (73%), followed by various kinds of orthopedic aids (canes, crutches, wheelchairs, prostheses and braces, and walkers). Hearing aids were relatively rare (6%) and may represent an underutilized resource. Correspondingly, many respondents (ranging from 33% to 57%, depending on the study area) needed eyeglasses or needed improved eyeglasses. The need for improvement in other devices varied considerably from one study to the next.

For all of the needs assessment study areas, the most common disabilities reported by respondents were diabetes (28%); blindness, visual impairment, or glaucoma (25%); arthritis (24%); substance abuse (20%); hypertension (17%); other orthopedic disorder or impairment (14%); and hearing impairment or deafness (14%). The most common activity limitations reported by these respondents were working on a job (e.g., full-time, not missing work) (54%), walking (51%), lifting (50%), remembering (39%), reading (36%), seeing (35%), use of arms (31%), use of hands (30%), writing (25%), sitting (21%), self-care (e.g., dressing, bathing, shopping, etc.) (21%), having a sexual relationship (19%), and hearing (19%) (Schacht, 1996). We do not know whether this asymmetry in the sensory impairments (visual impairment being almost twice as common as hearing impairments) is due to medical factors, such as the incidence of diabetes; cultural factors, such as differential responses to hearing loss and loss of visual acuity; or technological factors, such as the complexity of hearing aids (e.g., batteries, volume controls) compared with eyeglasses.

Each of these needs assessments included a series of items, defined by each community, that measured consumer satisfaction on a number of issues, including assistive devices. Each item was also rated according to its perceived importance. The combination of importance and satisfaction was then used to compute a "problem index" for each item. In the discussion below, a relative "problem" refers to an item high in importance but low in satisfaction. The most highly rated problems in two of the studies were two similarly-

worded items. Both items were used in rural northwest New Mexico and were as follows (Sanderson, Schacht & Clay, 1996, pp. 21, 69):

> Item CC-24: ...assistive devices (such as wheelchairs, braces, hearing aids, and so on) are available and affordable?
>
> Item CC-25: ...financial assistance for examinations and reasonably priced assistive and high tech devices (such as wheelchairs, braces, hearing aids, adaptive technology, and so on) are available to American Indians with disabilities?

Interviewers asked participants first how important a particular item was ("How important is it to you that___?") and then how satisfied she or he was with that item ("How satisfied are you that___?"). This same procedure was followed for all other consumer concerns items of this kind.

One highly rated relative problem in two of the studies was item CC-25, concerning the availability of financial assistance for examinations and the availability of reasonably priced assistive and "high-tech" items (such as wheelchairs, braces, hearing aids, adaptive technology, and so on). This was considered one of the top 10 relative problems (out of 30-35 items) both in the Houston metropolitan area and in rural northwestern New Mexico. A similar question was asked in southern Arizona, but the level of satisfaction was higher in that study. The second highly rated relative problem in two of the study areas was item CC-24, which asked about the availability and affordability of assistive devices (such as wheelchairs, braces, hearing aids, and so on). This item was one of the top 10 relative problems in rural northwestern New Mexico and in the Dallas-Forth Worth metroplex but was not considered as important in the Minneapolis-St. Paul area (Schacht, 1996). These studies indicated that availability and affordability of assistive devices were perceived to be major problems in a number of American Indian communities, both urban and rural.

In a study of independent living (IL) data from 121 American Indian consumers provided by 11 counselors in five states (Sanderson, Schacht & Clay, 1996), the most frequent primary disabilities were quadriplegia (N=14) and paraplegia (N=12). Only six consumers reported using rehabilitation engineers, but when they were used, the consumer's IL goals were reached, on the average, two weeks sooner than if the engineers were not used. Prostheses and other appliances and devices were usually provided by a medical equipment dealer (19 out of 31 consumers) or by state IL rehabilitation services (ILRS) (8 consumers), but were usually paid for by ILRS (25 out of 30 consumers; payor unknown in one case).

Parette and VanBiervliet (1990) published a consumer satisfaction survey on AT services. About 10,000 surveys were mailed out and 2,201 were returned. Of these, 981 were completed by people with physical disabilities, and the report focused on these respondents. The consumers were asked about their satisfaction regarding 10 items. There was a follow-up question for each item that unfortunately was not explicitly stated in the report, although the data were provided. For example, only 20% agreed that they had an opportunity to buy their assistive device or service on credit, while "58 percent reported that such a plan would be helpful in purchasing needed devices" (p. 7). The questionnaire also asked about assistive devices and services used and about unmet needs for such devices and services. There were 16 items relating to "life functioning" that resembled the now standard list of activities of daily living (ADL). These data provide an interesting baseline for the general population with which data for American Indians and Alaska Natives can be compared.

The Digital Divide and Access to Assistive Technology

Background

The concept of the "digital divide" emerged in recent years as a way of dramatizing the implications of low rates of telephone use, per capita computer ownership, and the number of computers equipped with modems among some sectors of the population. Concern with the digital divide was based on several key studies on the

National Information Infrastructure (NII). One of these studies emerged from the work of the National Council on Disability (NCD) task force on technology in 1995, which resulted in a report (NCD, 1996) calling attention to the NII and its implications for people with disabilities, and using the term "Information Superhighway." The NCD advocated use of the information superhighway, or the NII, to improve communication among people with disabilities; it was believed that this would lead to an increase in access and use of AT information. The NII was also believed to be a means to decrease isolation for persons with disabilities by facilitating interaction with others, nationally and internationally, and to increase access to educational and medical services.

At about the same time, the U.S. Department of Commerce (1995) was conducting research on the NII. This report documented, among other factors, that Native Americans had the fewest telephones per capita, and that among households with computers Native Americans were among the least likely to have modems. This report, updated in 1998 (U.S. Department of Commerce, 1998) at the request of Vice President Al Gore, headlined the concept of the "digital divide."

Perhaps as a result of these studies and reports, subsequent federal legislation provided clear mandates for the provision of AT devices and services across educational, vocational, and community settings. Such legislation included the Assistive Technology Act of 1998. This Act provided, among other clauses, the rationale for increasing awareness of policies and procedures that facilitate or impede the acquisition of AT. On March 13, 1998, President Clinton set a goal for the United States to employ people with disabilities at the same level as the general population (Executive Order 13078, 1998).

In October 1999, Rachel Anderson (1999) published a substantial article on Native Americans and the digital divide. In this report, Anderson reported that "Native Americans on reservations have historically lacked the high level of telecommunications services enjoyed by many Americans" (p. 1). In her conclusions, Anderson (1999) suggested that efforts to eliminate the digital divide in telecommunications in Indian Country must include updating statistics about telephone and Internet access among Native Americans, as data being currently used relied on the 1990 U.S. Census. She also

argued that culture and identity, as well as the issue of dealing with tribal sovereignty, still posed challenges to initiatives to eliminate the digital divide.

The factor of tribal sovereignty has also been examined with the technological infrastructure in mind by Casey, Ross and Warren (1999), who used the term "cybersovereignty." On December 9, 1999, the Department of Commerce held a national conference on the digital divide, attended by Susan Masten, President of the National Congress of American Indians (NCAI). Masten (1999) issued a press release stating that:

> While the Clinton administration is taking steps to include Sovereign Native American Tribes in efforts to bring Internet and computer access to under served communities, we know that many reservations are lacking adequate access to even basic phone service, thus making our technology challenges unique.

On February 2, 2000, NCAI, along with other civil rights and community-based organizations, attended the launching of "Power Up—Bridging the Digital Divide" by former President Clinton and the Chief Executive Officer of America Online. The president's address paid specific attention to the technology needs of American Indians, and announced an initiative that included a FY2001 funding request for $10 million to prepare American Indians for careers in the field of information technology (NCAI, 2000).

On April 17, 2000, the White House issued a Fact Sheet on "Indian Country and the Digital Divide" to accompany the president's visit to Shiprock, New Mexico, on the Navajo Nation (White House Press Office, 2000). According to the Boston Globe, "President Clinton on Monday pledged during a visit to a hardscrabble Navajo reservation town to help American Indians enter the Internet age through greater access to a 19th-century invention—the telephone" (Holland, 2000). Accordingly, the Federal Communications Commission (FCC) conducted a series of initiatives over the next six months addressing telephone access issues in Indian communities (FCC, 2000).

The Evidence

In 1990, the U.S. Census began tracking telephone usage. According to a U.S. Department of Commerce study (1995, Table-Chart 4), an examination by race revealed

that American Indians (including Aleuts and Eskimos) in rural areas proportionately possessed the fewest telephones (75.5%), followed by rural Hispanics (79.0%) and rural Blacks (80.9%). For those households with computers, American Indians (28.3%) and Asians/Pacific Islanders (26.7%) registered the lowest position among those possessing modems (U.S. Department of Commerce, 1995, Table-Chart 6). Whether or not a household with a personal computer was also an Internet user varied by race and ethnicity. For instance, usage ranged from high levels of use by Asians/Pacific Islanders (65.0%) and Whites (63.5%) to lower usage levels by American Indians/Eskimos/Aleuts (53.2%), Hispanics (48.7%), and Blacks (47.4%) (U.S. Department of Commerce, 1999).

Perhaps because of their relative lack of telephone access and lack of modems, American Indians/Eskimos/Aleuts often turned to Internet access outside the home. They were more likely than people in other racial or ethnic groups to go on-line at K-12 schools (36.5%), at a public library (14.7%), or by using someone else's computer (21.1%). However, they were least likely (34.8%) to be connected at work (U.S. Department of Commerce, 1999, Chart II-17).

American Indians surpassed Whites in percentage of: 1) on-line classified ad searches (urban and central city American Indians, 48.6% and 27.0% respectively); 2) taking courses (rural American Indians, 51.7%); and 3) accessing government reports—rural, urban, and central city American Indians (45.4%, 46.4%, 41.8%, respectively) (U.S. Department of Commerce, 1995). Minorities were taking courses at home or conducting school research on-line at rates higher than the national average (3[illegible].1%) or Whites (35.3%). Blacks and Hispanics ranked highest at 43.5%, followed by American Indians/Eskimos/Aleuts at 42.9%. Minorities were also more likely users outside the home and pursued on-line courses and school research at even higher rates (50.3% for Hispanics, 47.0% for American Indians/Eskimos/Aleuts) (U.S. Department of Commerce, 1999).

The challenges that face American Indian communities in general with respect to the digital divide were also apparent among persons with work disability (Kaye, 2000). While the percentage of American Indians with work disability who had computers in

their households (20.7%) was higher than that of Blacks (10.7%) or Hispanics (19.0%), it was still below that of Whites (26.8%). In his argument that people with disabilities had the most to gain from new technologies, Kaye charged that the digital divide would remain wide unless concerted efforts were undertaken:

> In order to clarify the benefits that this technology can offer to the population with disabilities, a concerted program of education will be needed, along with training and support in the use of the hardware and software, before significant progress is made in closing the enormous gaps in technology access (p. 13).

Review of Existing Databases

Current Population Survey

The preceding review provides information about needs for assistive technology on the part of American Indians and Alaska Natives and pointed to the importance of telecommunications access in providing information about AT in Indian Country. Two principal sources exist for nationwide data on access to telephone services. First, the Current Population Survey (CPS), conducted three times each year by the U.S. Bureau of the Census, U.S. Department of Commerce, includes questions on telephone subscription and (since 1994) on computer/modem ownership and usage. Second, the Federal Communications Commission's (FCC) Industry Analysis Division, within the Common Carrier Bureau, uses the CPS data to produce regular reports that provide a detailed demographic profile of telephone subscribership in the United States (U.S. Department of Commerce, 1995). The CPS also tracks information about employment. It has therefore become a primary means of measuring access to the information superhighway. However, the CPS has virtually no information about disabilities.

RSA-911 Case Service Reports

Each year, the Rehabilitation Services Administration (RSA) collects data from every state VR program on a standardized form known as the RSA-911 Case Service Report (CSR); tribal VR projects, however, do not submit this information. Each CSR provides a snapshot of the services that a particular client received through VR that year.

The CSR includes data on race and ethnicity as well as information on what services the client received, including whether or not the client received AT services or help with AT devices.

National Health Interview Survey (NHIS)

The NHIS is a national probability sample of the entire U.S. population. Conventional demographic information is collected every year, including information about ethnicity and race as well as about health, disability, activity limitations, ability to work, employment, and assistive technology devices. However, there are no questions about AT services. Some questions may imply AT services; for example, questions about whether the respondent used visual aids, hearing aids, mobility aids, or braces. About every 10 years, additional questions are asked in a followback survey of respondents who have disabilities (about 25% of the original respondents), probing details of health and disability, etc. This database is very large and complex but contains potentially useful information about American Indians and Alaska Natives who use AT.

METHODOLOGY

Research Hypotheses

The present AIRRTC research was guided by a number of hypotheses:

1. American Indians who are receiving employment services do not receive AT services at the same rate as other races or ethnic groups.
2. Barriers to receiving AT services for American Indians, both on and off reservations, include:

   2a. AT services are not considered or are overlooked for American Indian clients because of beliefs on the part of service providers (VR counselors and others) that AT would not be useful, would not be understood or used, or would be too expensive.

   2b. American Indians feel more stigmatized by their disabilities when they use AT.

2c. American Indian clients do not advocate effectively for themselves when AT is applicable to their conditions.

2d. American Indians who need AT are not aware of services for which they are eligible.

2e. Socioeconomic factors compromise the availability and affordability of AT services to American Indians with disabilities.

3. Assistive devices (e.g., hearing aids) are underutilized by American Indians and Alaska Natives who need them.

Research Populations

This project involved a number of parallel investigations, each with its own research population, instrumentation, and procedure. These investigations included a consumer survey, Internet courses for AT service providers, and an analysis of two national databases (RSA-911 and NHIS-D).

Consumer Survey

Research Population

The population for the consumer survey consisted of American Indian adults with disabilities in small towns (with a population of less than 70,000) and in rural or rural reservation areas. These research participants were recruited to respond to a questionnaire (see Appendix A) about their experience of and need for AT services. Recruitment began by establishing collaborative relationships with the Consortia of Administrators for Native American Rehabilitation (CANAR) and other interested projects. The respondent group was identified primarily through the tribal VR programs associated with CANAR. The original goal was 50 respondents; however, only 15 questionnaires were obtained.

We also attempted to recruit another group of respondents through projects funded by the Assistive Technology Act of 1998 in the 14 states with more than 50,000

American Indians or Alaska Natives [Alaska, Arizona, California, Washington, Florida, Michigan, Minnesota, Montana, New Mexico, New York, North Carolina, Oklahoma, South Dakota, and Texas (U.S. Census Bureau, 1999)]. These projects were asked to identify a contact person to distribute the AIRRTC survey instrument. Contacts were identified for 10 of these states. Our original goal was an additional 50 respondents. Unfortunately, this method of recruiting respondents did not produce any usable results.

Survey Instrument

The AIRRTC survey instrument was designed following review of other instruments that assess changes in performance of people with disabilities as they learn to use assistive technologies, manage human resources (i.e., personal attendants, aids, and family), and modify their physical environments. These instruments included a 1997 public information survey designed by the Arizona Technology Access Program (AzTAP), a barrier assessment from the Hawaii Assistive Technology Training Services (HATTS) program, and a consumer and service survey from the Minnesota System of Technology to Achieve Results (STAR) program. A draft survey instrument was pilot tested with 10 American Indians who used AT devices, and the survey questionnaire was revised as a result of their responses and comments.

Procedure

The research team contacted tribal VR programs, which then helped contact potential respondents. Identified potential respondents received questionnaires, informed consent forms, billing forms, return envelopes, and a stipend of $20 for their assistance in completing the survey. The respondents mailed the questionnaires back to the AIRRTC directly.

Internet Courses on AT for Service Providers

Research Population

The research population for this part of the study consisted of people who provide AT services to American Indians with disabilities or who supervise those service providers. Most participants either worked in a tribal VR office or provided services to

American Indian clients through a non-tribal VR agency or contractor. The participants were recruited during the spring and summer of 1999 through a CANAR conference call, presentations to a regional meeting of the Navajo Nation Office of Special Education and Rehabilitative Services, and project mailings and e-mail discussion groups, such as the AIRRTC IL-List.

Each participant enrolled in the Northern Arizona University (NAU) University Affiliated Program (UAP) course, UAP 505: "Assistive Technology in the Lifespan (see Appendix B) or its successor, ESE 599: "Assistive Technology." Both courses covered all aspects of AT, including funding and policy issues, and were developed to serve the needs of multiple audiences. For the Fall 1999 semester, 10 to 15 slots were reserved for VR counselors, tribal VR counselors, and program administrators; 10 students enrolled for UAP 505, all of whom were American Indians, eight Navajo and two Hopi. One participant had a disability, all served American Indians with disabilities, and all were either tribal VR counselors or supervisors of tribal VR counselors. During the Summer 2000 session, a total of 40 enrolled for ESE 599, five of whom provided services to American Indians with disabilities. Two of these were American Indians, and according to their self-report, Apache and Papago. Four of the five who served American Indians with disabilities were teachers who provided transition services to children or worked with VR projects. The other participant was a VR counselor. For the purposes of this project, only these five students enrolled in ESE 599 were included in the research.

Procedure

Individual students were contacted during the spring and late summer of 1999 to determine their training needs. The UAP 505 was an existing course at NAU, but had only been offered in a face-to-face format before. It was modified during the summer of 1999 for a web-based format, and to meet the needs of persons serving American Indians with disabilities (see Appendix B). Specific modifications included:

a. Information about VR rules, regulations, and legislation

b. Information about cultural aspects of disabilities

c. Examples of adults with disabilities using AT (e.g., using a communication device at work or using text enlargement in the community)

d. Technology that would be useful in the workplace

e. References to research related to adults with AT needs.

During the Fall 1999 semester, the on-line UAP 505 AT course was offered to VR counselors of American Indians and Alaska Natives with disabilities. A new online course, ESE 599, was developed during the Spring 2000 semester to address content issues identified in the 1999 UAP 505 course evaluations. The course was presented during the full 10-week session, Summer 2000.

Participants enrolled in both courses (UAP 505 and ESE 599) were recruited to help provide information about barriers to receiving AT services for American Indians, both on and off reservations (research hypothesis 2). The instructor for the course, Larry Gallagher, Ed.D., compiled student feedback on AT issues that was then analyzed qualitatively for insights regarding the AT needs of American Indians with disabilities.

Analysis of RSA-911 and NHIS Data

As described earlier, the RSA-911 CSR includes data on race and ethnicity, as well as on whether or not the client received AT services or help with AT devices. This information was used to determine if American Indians who are receiving employment services receive AT services at the same rate as other races or ethnic groups (research hypothesis 1). Data for the most recent year available, 1998, were obtained and analyzed by paired chi-square analyses of race/ethnicity by use of AT services or devices.

For further comparison, the 1994-1995 National Health Interview Survey (NHIS) was analyzed for differences in usage of hearings aids, mobility aids, and braces between American Indians and Alaska Natives and other races or ethnic groups. Unlike the RSA-911 database, NHIS uses probability sampling. Case weights were therefore applied for analyses. Weights are applied "if you have a sample from a population for which some substratum has been over- or undersampled" (Statistical Package for Social Sciences,

1988, p. 186). In the context of the NHIS database, racial groups were not uniformly represented in the population surveyed. Thus for this analysis case weights were used in frequency computations to permit comparison of results from different population groups.

RESULTS

Four kinds of data were analyzed: data from the 1998 national RSA-911 annual report, from the 1994-1995 NHIS, from questionnaires sent to American Indians who had used or were in need of AT, and from the 15 participants in the on-line AT courses.

RSA-911 Data Analysis

A comparison of AT use among American Indians and other ethnic groups was conducted using the RSA-911 database (RSA, 1998). This database contained information submitted by all state VR agencies on the demographic and economic characteristics of consumers whose cases were closed in any closure status in a given year. Overall, 599,372 cases were reported in 1998. Of these cases, the following were used for analysis: 468,537 (78%) ATD cases and 467,862 (78%) AT service cases; and those closed in status 26 (closed, rehabilitated), 28 (closed, not rehabilitated, after employment plan initiated), or 30 (closed, not rehabilitated, before IWRP initiated). The totals differ slightly because of missing data.

The database had two variables relating to AT, one for ATD and the other for AT services. These dichotomous variables were cross-tabulated with "race" categories (Table 1) and a chi-square test of the null hypothesis (that frequency of use of ATD does not differ across races) led to rejection of the null hypothesis (χ^2 (3, N = 468,537) = 330, $p <$ .001). Table 1 shows that 5.9% of American Indians and Alaska Natives used an ATD, compared to 7.2% of all races together. Only Blacks had a similarly low rate of ATD use, approximately the same as American Indians and Alaska Natives at 5.9%. The chi-square test results implies that ATD usage rates for American Indians, Alaska Natives and Blacks were significantly lower than for Whites, Asians and Pacific Islanders.

Table 1

1998 VR Consumer Use of AT Devices and AT Services

	Used ATD		Total	Used AT Services		Total
	N	%	N	N	%	N
White	27,206	7.6	358,652	36,193	10.1	358,132
Black	5,846	5.9	98,503	12,349	12.6	98,356
Asian & Pacific Islander	439	6.8	6,476	596	9.2	6,470
American Indian/ Alaska Native	288	5.9	4,906	338	6.9	4,904
Total	33,779	7.2	468,537	49,476	10.6	467,862

Source: RSA-911, 1998

Rates of AT service use were higher for all races than rates of ATD use (Table 1). When service rates were compared across races, 6.9% of American Indians and Alaska Natives used such services, compared to 10.6% for the population as a whole. A chi-square test of the null hypothesis (that frequency of utilization of AT services does not differ across races) led to rejection of the null hypothesis (χ^2 (3, N = 467,862) = 574.249, $p < .001$). The rate of use of AT services by American Indians and Alaska Natives was the lowest of the four races for which data were available. In addition, both the rate of use of AT services and ATDs of American Indians and Alaska Natives was lower than that of Whites and Asians/Pacific Islanders.

In conclusion, although data reported in the RSA-911 database may not be representative of the general population of all American Indians and Alaska Natives with disabilities, findings support the first hypothesis, that American Indians and Alaska Natives who are receiving other employment services do not receive AT services at the same rate as other races or ethnic groups.

NHIS Data Analysis

Further comparison of AT usage by American Indians and Alaska Natives was conducted using the 1994-1995 National Health Interview Survey, which included many

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questions on the use of assistive devices. The most common devices in use were mobility aids, braces, and hearing aids. The "race" variable was cross-tabulated with "use hearing aids," "use mobility aids," and "use brace" frequencies. Table 2 summarizes case-weighted information using weights provided by NHIS that reflect its probability sampling.

Concerning the use of hearing aids, 1.1% of American Indians and Alaska Natives used the devices, compared to 1.9% of Whites. However, the percentage of American Indians and Alaska Natives using hearing aids was higher than that of Blacks (.5%), Asian and Pacific Islanders and Others (.6%), while lower than that of all Other Races taken together (1.6%). Chi-square tests using Yate's correction between pairs of races were run on these differences. The difference in frequencies between Whites and American Indians was statistically significant, χ^2 (1, N = 162,059) = 6.366, p =.012. Differences in frequencies were also significantly different between American Indians/Alaska Natives, and (a) Blacks, χ^2 (1, N = 27,410) = 12.435, $p < .001$ and (b) Asian and Pacific Islanders and others (Table 2), χ^2 (1, N = 15,050) = 5.516, $p < .05$. These results showed that the rate of utilization of hearing aids by American Indians and Alaska Natives (1.1%) was less than that of Whites but higher than that of Blacks (.5%) and Asian and Pacific Islanders and Others (.6%).

Concerning the use of mobility aids, American Indians and Alaska Natives (3.6%) used the devices more frequently than all other races, individually and combined. Chi-square tests run on the results between pairs of races showed statistically significant differences at the 95% confidence level or better between American Indians and Alaska Natives and Asian and Pacific Islanders and Others, χ^2 (1, N = 17,008) = 55.851, $p <$ .001, using Yate's correction. Tests for other differences were not statistically significant. Therefore, the rate of utilization of mobility aids by American Indians and Alaska Natives was higher than that of all other races studied.

Table 2

1994-95 National Health Interview Survey AT Device Usage

	Total	Used Hearing Aids		Used Mobility Aids		Used Brace	
		N	%	N	%	N	%
Total 94-95 NHIS	202,561	3,228	1.6%	5,840	2.9%	3,271	1.6%
American Indian/ Alaska Native	1,958	21	1.1%	71	3.6%	44	2.2%
Other Races	200,603	3,207	1.6%	5,769	2.9%	3,227**	1.6%
White	160,101	3,001*	1.9%	4,738	3.0%	2,692	1.7%
Black	25,452	117**	.5%	829	3.3%	385**	1.5%
Asian and Pacific Islanders and Others	15,050	89**	.6%	202**	1.3%	150**	1.0%

Source: 1994 -1995 National Health Interview Survey

*Rate is significantly higher than that of American Indians and Alaska Natives at the 95% confidence level or better.

**Rate is significantly lower than that of American Indians and Alaska Natives at the 95% confidence level or better.

With respect to the use of braces, the percentage for American Indians and Alaska Natives (2.2%) was higher than for those of other races. Chi-Square tests using Yate's correction run on the cross-tabulations show statistically significant differences at the 95% confidence level between American Indians and Alaska Natives and Blacks, χ^2 (1, $\underline{N}$ = 27,410) = 5.9, $p < .012$, Other Races, χ^2 (1, $\underline{N}$ = 202,561) = 4.583, $p < .033$, and Asian and Pacific Islanders and Others, χ^2 (1, $\underline{N}$ = 17,008) = 22.931, $p < .001$. Results were not statistically significant for Whites. Therefore, the rate of utilization of braces for American Indians and Alaska Natives was significantly higher than that of all other races combined or taken separately, except for Whites.

Consumer Data Analysis

Results from the AIRRTC survey were analyzed primarily with qualitative techniques because of the small sample size (N=15). Data on consumer ratings of importance and satisfaction were analyzed quantitatively according to procedures developed for the Consumer Concerns method (e.g., Schacht, Hickman, Klibaner, &

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Jordan, 1993). Analyses were based on the 15 questionnaires that had been returned by October 27, 2000.

Analysis of Demographic Information

Eleven respondents (73%) completed their own questionnaires, one (7%) was assisted by a family member or friend, and two (13%) were assisted by VR counselors. There were six (40%) female respondents and 9 (60%) male respondents.

A variety of American Indian and Alaska Native tribes was represented. The Sioux and Lakota Sioux tribes were represented by four respondents (27%). Two respondents (13%) were Assiniboine Sioux. Each of the following tribes or Alaska Native villages were represented by one respondent (7% each): Chefornak, Choctaw, Makah, Navajo, Cheyenne River Sioux, Springs/Wasco/Blackfeet, Nez Perce, Warm Springs, and White Earth Chippewa Band.

By reservation, respondents from the Fort Peck Reservation (n=4; 27%) were the most represented. Three respondents (20%) were from the Cheyenne River Sioux Indian Reservation. The Lummi, Nez Perce, Warm Springs, White Earth, and Yakima reservations were each represented by one respondent. By state, Montana had the largest number of respondents (n=4; 27%). Three (20%) were from South Dakota and two (13%) respondents were from Washington. Respondents were also from Idaho, Minnesota, Alaska, Arizona, Oklahoma, and Oregon.

Table 3 summarizes the disabilities, impairments, and chronic conditions that respondents reported. Respondents were permitted to identify more than one disability. The most frequent disabilities were diabetes (n=4; 29%), hypertension (n=4; 29%), and substance abuse (n=4; 29%).

Table 3

Disabilities, Impairments, or Chronic Illnesses of Respondents

Disabilities	n	%
Diabetes	4	29%
Hypertension	4	29%
Substance abuse	4	29%
Arthritis	3	21%
Speech/language disorder	3	21%
Anxiety	2	14%
Orthopedic disorder	2	14%
Specific learning disorder	2	14%
Hard of hearing	2	14%
Visual impairment	2	14%
AIDS/HIV	1	7%
Developmental delay/disability	1	7%
Fetal alcohol syndrome	1	7%
Kidney disorder (stones)	1	7%
Knee regeneration	1	7%
Mental retardation	1	7%
Neurological impairment	1	7%
Obesity	1	7%
Personality disorder	1	7%
Born without arms	1	7%
Cancer	1	7%
Cerebral palsy	1	7%
Spinal cord injury	1	7%
Stroke	1	7%
Amputation	1	7%
Von Hipple-Lindau	1	7%

With regard to housing (see Table 4), six respondents (40%), all of whom were from rural and reservation areas, lived in their own houses. All respondents (N=15) had electricity, running water, and telephone in their home, except for one respondent who did not have running water and one respondent who did not have a telephone.

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Table 4 Housing and Utilities of Respondents		
	Yes (n)	%
Where do you live?		
Your own home	6	40%
Your parents' home	3	20%
Apartment	3	20%
Rental home	1	7%
Hotel	1	7%
Other	1	7%

The number of hours that respondents were assisted in activities of daily living ranged from 2 to 14 hours in each 24-hour day. Six respondents (40%) did not require any assistance (see Table 5).

Table 5 Average Number of Hours of Assistance in Activities of Daily Living		
Helper	**N**	**%**
Unpaid relative		
2 hours	3	20%
12 hours	1	7%
Hired/Paid Person		
2 hours	1	7%
3 hours	1	7%
4 hours	1	7%
8 hours	2	13%
14 hours	1	7%
No assistance required	6	40%

Regarding education (see Table 6), the highest number of respondents had completed either high school or the General Equivalency Diploma (GED) (n=5; 33%) or some college (n=4; 27%).

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Table 6 Highest Level of Formal Education		
	n	%
Some high school	2	13%
High school graduate (GED)	5	33%
Post-secondary school other than college	1	7%
Some college	4	27%
College degree	1	7%
Some graduate school	1	7%
Graduate degree	1	7%

The respondents were almost evenly split between those not employed (n=8; 53%) and those employed in various capacities (n=7; 47%) (Table 7). Six respondents (40%) were receiving employment services through the VR program; three respondents were seeking employment, and three others had been placed but their cases had not yet been closed.

Table 7 Employment Status and Employment Services		
	n	%
Are you presently employed?		
No, not seeking employment	5	33%
No, seeking employment	3	20%
Yes, employed full-time (30 hours or more a week)	4	27%
Yes, employed part-time	1	7%
Yes, in supported employment	1	7%
Yes, self-employed	1	7%
Are you receiving any employment services?		
Yes, Vocational Rehabilitation	6	40%
Yes, Temporary Assistance for Needy Families (Welfare to Work)	3	20%
Yes, Job Training Partnership Act/Work Force Investment Act	2	13%

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Monthly earnings reported by respondents ranged from less than $150 to $1,300 - $1,600. The largest number of respondents reported receiving a monthly income of $450-$600 (n=6; 40%), followed by those reporting a monthly income of $750-$900 (n=4; 27%).

Analysis of Data Regarding AT Devices

Respondents were asked to list ATDs that they "have" and "use" (see Appendix A, Section B). In the following analysis, "used" implies "had" unless otherwise noted. It should also be noted that a respondent might have had and used more than one ATD.

The first set of devices respondents were asked about were aids for daily living—self-help aids for use in such activities as eating, bathing, cooking, dressing, toileting, and home maintenance. The aids that respondents reported using included "'DonJoy knee brace,' transfer bench for shower, handicap bathroom, reacher, personal assistant, can opener, tape recorder, wheelchair, and 'rocker knife,'" which may refer to the Rocking "T" Knife (see http://www.ilp-online.com/html/rockingt.html). This knife makes cutting easier for people with a weak grasp or the use of only one hand. The "DonJoy knee brace" refers to the DonJoy Playmaker knee brace (see http://kneesupport.com/DonJoy/index.htm).

The second set of devices respondents were asked to identify were environmental controls, defined as primary electronic switches or systems that enable a person without mobility to control appliances, electronic aids, lights, telephones, security systems, etc. in a room, home, or other surroundings. Two respondents used or have used such environmental control devices, described as a telephone, switches, and a "drag and dictate" machine, which may be a reference to a computer with Dragon speech recognition software (see http://www.lhsl.com/naturallyspeaking/). One respondent used both telephone and switches.

Ambulation aids were defined as devices that help people walk upright, including canes, crutches, or walkers. "Upright," in this context, referred to the upper half of the torso. Under ambulation aids, the most frequently reported devices were canes (n=3; 20%) and wheelchairs (n=2; 13%). The respondents who indicated wheelchairs may have treated this category as mobility aides, not realizing that there was another category for

that purpose. Respondents reported using ATDs identified as a pair of crutches, 3-wheel scooter, walker, foot brace, foot support, foot straps, trunk/head supports, lateral supports, and cushion seat.

Two respondents (13%) reported using devices in the category of seating and positioning aids. One was using a wheelchair cushion and the other was using foot straps, trunk/head supports, lateral supports, and a cushion seat. Seating and positioning aids were defined as modifications to wheelchairs or other seating systems that provide greater body stability, upright posture or reduction of pressure on the skin surface, such as wheelchair cushions, trunk/head supports, modular seating, and seat lifts.

Under prosthetics and orthotics aids, six devices were used: left and right arm hook prostheses, artificial limb, foot brace, DonJoy knee brace, and leg support. Prosthetics and orthotics (e.g., braces and artificial limbs) were defined as devices that replace and/or augment missing or non-functioning body parts. Two of these devices had already been identified as ambulation aids (foot brace and foot support), while the DonJoy knee brace was also listed among aids for daily living.

Under architectural items, four devices were used by respondents. Architectural items were defined as structural adaptations to the home or worksite that remove or reduce physical barriers. Such items include ramps and elevator lifts, as well as minor physical adaptations such as replacing doorknobs with levers or installing grab bars in bathrooms. In addition to these, one respondent reported using a ramp, but did not report "having" it; this might have referred to a ramp at the person's workplace.

Respondents were asked to identify the transportation aids they were using. Transportation aids were defined as items that enable independence in personal transportation, such as adapted cars and vans, child restraint systems, and modifications to ensure vehicle access. One respondent reported two devices, a van wheelchair and a van lift. Another respondent reported that he used a van that had been adapted, but no particular device was identified, and he did not report "having" (owning?) this device.

Under the category of mobility aids, four devices were identified by four (27%) respondents. Mobility aids were defined as devices that allowed freer movement,

including transfer aids and patient lifts, as well as all types of wheelchairs and three-wheeled vehicles. Wheelchairs were the device most often reported (n=4; 27%).

Six sensory aids were reported by five respondents. Sensory aids were defined as equipment for people with vision or hearing disabilities. Devices included hearing aids, eyeglasses and other low-vision aids, and reading devices (e.g., reading stand, page-turner, easel, magnifier, signal strobe, vibrating alarm clock). Eyeglasses (including bifocals) were the most reported item (n=5; 33%). One respondent reported using a reading stand that he or she did not report "having."

Under communication aids, one respondent reported a telephone with volume control (n=1; 7%) and a loud ringer with amplifiers (n=1; 7%). Another respondent was using a similar device on loan and expected to receive his or her own device in the near future. Communication aids were defined as aids for people with communication impairments. Devices potentially included augmentative communication devices and prosthetics, manual and electric picture boards, TTY/TDD, carryover phone, and volume controlled telephone system.

Six devices were reported under educational or vocational aids, defined as equipment that enables people with disabilities to carry out school- or work-related tasks. Four respondents had computers but only three of them were using their computers. One of the computers was equipped with "drag and dictate." (As noted above, this may be a reference to a computer with Dragon speech recognition software.) A fifth respondent had a "Lite writer computer" on loan for three months but was not using it. The "computer" is probably a reference to the LightWRITER$_{tm}$ keyboard (see http://www.zygo-usa.com/lighwrts.htm), described as a "dedicated augmentative communication/conversation aid" with an LCD screen and a speech synthesizer. Three respondents used tape recorders. Other educational or vocational aids reported by the respondents included a voice modulator (used with the "drag and dictate" equipped computer), a stationary bike, and a headphone set.

Finally, respondents were asked to identify recreational aids they used. Recreational aids were defined as aids for adaptations to sports equipment (e.g., special shoes or bicycles) that enable people with functional limitations to participate in

recreational activities. Four devices were reported by three respondents. One of the respondents had two pairs of orthopedic shoes. Respondents also reported having a knee brace, a bicycle, and a walker/tread mill. However, the respondent with the bicycle and treadmill was not using these recreational aids. A fourth respondent needed special shoes. One respondent (the person who had a bicycle and treadmill but was not using them) reported having "oars" without explaining the meaning of oars in this context.

Overall, the most frequent ATDs that respondents used were devices for ambulation and aids for daily living. However, it must be mentioned that some ATDs were identified in more than one category. For instance, wheelchairs were listed among aids for daily living, ambulation aids, and mobility aids. Three-wheel scooters were identified as ambulation aids and as mobility aids. Some categories were not represented at all. Bed aids were unreported, and only one respondent (7%) identified a transportation aid.

Respondents identified a number of ATDs that they did not have but felt were necessary for them or would help them to do things more easily or independently. These included: higher bed, couch or big chair, faster computer with more RAM, ramps, grab bars, motorized cart, long handle devices for reading, handicap bathroom, rolling chair in home, hand-controlled lift, adapted van for mobility, and "lite writer."

Asked whether or not their devices used electric power, two respondents (13%) had devices that did not use any. Four respondents (27%) had battery-powered devices, four (27%) had home use devices powered by public utility, and three (20%) had home use devices powered by local sources of electricity.

Overall, the largest number of respondents reported being very satisfied (n=6; 40%) or somewhat satisfied with their ATDs (n=6; 40%). However, one respondent (7%) stated that she or he was not satisfied at all.

Similarly, the largest number of respondents reported that they were either somewhat satisfied with the time it took to repair their most useful ATDs (n=4; 27%) or very satisfied (n=4; 27%) with the services they received for the ATDs they used. One respondent (7%) was not at all satisfied.

Analysis of Data Regarding AT Services

In addition to inquiring about respondents' level of satisfaction with their ATDs and their maintenance or repair, the questionnaire also asked respondents if, overall, they were satisfied with the services they received for their assistive devices. As with other responses about levels of satisfaction, respondents were either very satisfied (n=6; 40%) or somewhat satisfied with such services (n=5; 33%). Slightly more respondents (n=7; 47%) stated that their ATD did not help them find or maintain a job, compared to those respondents (n=6; 40%) who reported that their ATD did help them in this way.

Table 8 summarizes how often respondents used ATDs at home, school, or work. While at home, the largest number of respondents used ATDs more than once a day (n=7; 47%). However, at school or at work the number who never used ATDs was greater than the number who did use them. In other words, most people who used ATDs used them at home rather than at school or at work.

Table 8

How Often Respondents Used AT Devices

	n	%
At Home		
Never	3	20%
One to two times a week	1	7%
Five to six times a week	2	13%
Once a day	1	7%
More than once a day	7	47%
At School		
Never	9	60%
Once a month or less	1	7%
More than once a day	2	13%
At Work		
Never	7	47%
Three to four times a week	1	7%
Five to six times a week	2	13%
More than once a day	3	20%

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Of the most needed AT services, assessment/evaluation services were identified as needed but unavailable at home (n=4; 27%), together with acquisition services (n=4; 27%) and maintenance and repair services (n=4; 27%) (see Table 9).

Table 9

Types of AT Service(s) Needed but Unavailable in Different Environments

	n	%
Information		
Home	2	13%
Other	2	13%
School	1	7%
Work	1	7%
Assessment/Evaluation		
Home	4	27%
School	2	13%
Work	1	7%
Acquisition		
Home	4	27%
School	2	13%
Work	1	7%
Training		
School	2	13%
Home	1	7%
Maintenance/Repair		
Home	4	27%
School	1	7%
Work	1	7%

Respondents were asked to report whether or not all AT services were available to them. For three respondents (20%), all AT services needed were available at home; for two respondents (13%), all services were available at work. One respondent (7%) listed school as the location that met all of their AT services needs, and two individuals (13%) listed other places.

Respondents were asked to identify all of the AT services they had received in the previous year (see Table 10). The largest number of respondents (n=6; 40%) had received evaluation and assessment of their ATDs.

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Table 10

AT Services Received by Respondents in the Past Year

	n	%
Assessment/evaluation for a device	6	40%
Information about assistive technology	4	27%
Acquisition of a device	3	20%
Training in the use of a device	2	13%
Maintenance/repair of a device	1	13%
I received no assistive technology services this past year	4	27%

Respondents were also asked to identify sources from which they had read or heard about AT in the previous year. The majority of the respondents had not read or heard about AT from newsletters (n=8; 53%), newspaper advertisements (n=9; 60%), radios (n=9; 60%), or vendors (n=8; 53%). Most of their information about AT had been received from disability organizations (n=7; 47%), friends (n=6; 40%), family members (n=4; 27%), and health care providers (n=4; 27%).

Of all the sources of information identified in the preceding paragraph, respondents were asked to identify the one source that was most important to them. None of those sources was identified significantly more often than others. The sources most frequently listed included disability organizations (n=3; 20%) and health care providers (n=3; 20%).

Respondents were asked to describe their awareness of what ATDs and services were available to them (see Table 11). The largest number of respondents stated that they were aware of what devices and services were available to them (n=5; 33%) or that they were somewhat aware but would like to know more (n=4; 27%).

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Table 11 Degree of Awareness of Available AT Devices and Services		
	n	%
I am very knowledgeable about assistive technology devices and services.	3	20%
I am aware of what devices and services are available to me.	5	33%
I am somewhat aware but would like to know more.	4	27%
I am generally unaware and need to know more.	1	7%
I am unaware but am comfortable with that.	-	-

In addition, respondents were asked to identify who provided them with AT services (see Table 12). More than one provider could be selected. For the largest number of respondents (n=5; 33%), VR counselors were the most frequently identified providers of AT services.

Table 12 Provider of AT Services		
	n	%
Vocational Rehabilitation Counselor	7	47%
Physical Therapist	3	20%
Orthotist/Prosthetist	2	13%
Audiologist	1	7%
Disability Support Services	1	7%
Prosthetics and Orthotic Clinic	1	7%

Making, Repairing and Maintaining AT Devices

Respondents were asked about making, repairing, and maintaining ATDs (see Appendix A, B12-16). The most frequently identified maker of their most useful or essential ATDs was the equipment manufacturer (n=5; 33%). Respondents also made devices themselves (n=3; 20%) or they were made by a rehabilitation engineer (n=3;

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20%). One individual listed "other" and named a prosthetics clinic. Devices that were identified as most useful or essential were eyeglasses, three-wheel scooters, knee braces, computers, wheelchairs, pens and paper, tape recorders, and prosthetic devices (hooks).

Respondents were asked to identify who repaired, maintained, or modified their most useful or essential assistive technology devices. The largest number of respondents identified themselves (n=6; 40%). The devices concerned were knee braces and tape recorders. Other respondents identified a family member (n=2; 13%), a rehabilitation engineer (n=1; 7%), and the equipment manufacturer (n=1; 7%).

Respondents were asked if there was a service that could come to their home for AT repairs or if they had to send their devices away. The largest number of respondents sent their devices away (n=5; 33%) or took them to cities (n=2; 13%). For two respondents (13%) no repair service existed at all. One respondent (7%) stated that there was a service available that would come to the home for AT servicing.

Finally, respondents were asked to estimate how long it took them to travel to see an AT service provider. It took about half an hour for the largest number of respondents (n=6; 40%). One respondent (7%) drove two hours for AT services and two respondents (13%) traveled three hours. One respondent (7%) had to travel six hours for AT services.

Participation in Activities Outside the Home

Respondents were asked to identify how often they participated in activities outside their homes and what, if anything prevented them from participating in such activities (see Table 13). A third or more of the respondents never participated in work-related (n=5; 33%) or school-related (n=7; 47%) activities. Nine individuals (60%) reported participating in social activities either daily or weekly, five (33%) in daily or weekly religious or spiritual activities, six (40%) in daily work activities, and two (13%) in daily school activities. Among activities that respondents participated in outside their homes were taking part in different boards and organizations (n=1; 7%), special meetings (n=1; 7%), subsistence commercial fishing (n=1; 7%), and fitness room activities (n=1; 7%).

Table 13

Frequency of Participation in Activities Outside the Home

	n	%
Social Activities		
Never (not at all)	1	7%
Once or twice a year	1	7%
Monthly	3	20%
Weekly	5	33%
Daily	4	27%
Religious or Spiritual Activities		
Never (not at all)	2	13%
Once or twice a year	2	13%
Weekly	2	13%
Daily	3	20%
Work-related activities		
Never (not at all)	5	33%
Monthly	2	13%
Daily	6	40%
School-related activities		
Never (not at all)	7	47%
Once or twice a year	1	7%
Monthly	2	13%
Weekly	2	13%

Reasons that prevented respondents from participating in activities outside their homes included the unavailability of a proper wheelchair (n=2; 13%), not being able to walk well or by oneself (n=2; 13%), need for a modified van (n=1; 7%), lack of transportation (n=1; 7%), speech impairment (n=1; 7%), and limited use of a hand (n=1; 7%).

Respondents were asked to comment on their AT needs (see Table 14). For each item a follow-up question asked, "Would this be helpful?" (Appendix A, Section B-19). For example, 10 of the 15 respondents (67%) indicated that they did not have the opportunity to buy devices or services on a "buy-on-time" or credit plan, and one reported having this opportunity (four respondents did not answer this question). Five of the 15 respondents (33%) thought that this opportunity would be helpful. For the question "If employed, did your employer change your work area or equipment to meet your needs?"

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the follow-up question was different, asking, "Has this affected your ability to do your job?"

Table 14

Unmet and Met AT Needs

	Yes		No		Would this be helpful?	
	n	%	n	%	Y	N
Did you have the opportunity to buy assistive devices or services on a "buy-on-time" or credit plan?	1	7%	10	67%	5	3
Have you received enough training in the use and care of your assistive device?	9	60%	3	20%	9	1
Were you given an evaluation before getting your assistive device?	10	67%	3	20%	8	1
Were you able to try out the device before paying for it?	6	40%	4	27%	6	2
If employed, did your employer change your work area or equipment to meet your needs?	4	27%	3	20%	4[(a)]	3[(a)]
Are transportation services being provided to you?	10	67%	2	13%	10	0
Do you need more information about assistive devices or services that could help you?	11	73%	1	7%	n/a	n/a

[(a)]see text for explanation

Respondents were asked, "Are you satisfied with the services you receive for the assistive devices that you use?" Answers were on a scale from 1 (*not at all satisfied*) to 3 (*very satisfied*). Six respondents (40%) indicated that they were very satisfied and five indicated that they were somewhat satisfied (33%). Four respondents did not answer this question.

Finally, respondents were asked to identify general areas of unmet AT needs (see Table 15). Among devices and services that respondents needed but could not obtain, the

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largest number of respondents listed AT devices and services for work and work training (n=4; 27%) and for getting around (n=4; 27%).

Table 15

Areas of AT Needs

Do you use assistive technology to help you with: (*Check all that apply*)	Do you need this device or service, but you can't get it?			
	Yes		No	
	n	%	n	%
Work and work training	4	27%	5	33%
Getting around	4	27%	3	20%
School training	3	20%	4	27%
Specialized seating	3	20%	3	20%
Specialized cars, vans and buses	2	13%	3	20%
Using a computer	2	13%	6	40%
Building accessibility	2	13%	3	20%
Recreation	2	13%	4	27%
Artificial limbs, braces and prostheses	1	7%	5	33%
Reading, writing and typing	1	7%	5	33%
Talking with others	1	7%	6	40%
Self-help	1	7%	7	47%
Taking care of home	1	7%	6	40%
Using a telephone	1	7%	7	47%
Things that help you see	-0-	-0-	6	40%
Hearing aids and other hearing devices	-0-	-0-	6	40%

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Analysis of Funding for AT Devices

Respondents were asked how much control they had over the selection of an ATD for purchase (see Table 16). The largest number of respondents (n=5; 33%) reported that they had no control over the selection. Only two respondents (13%) thought they made the final decision when purchasing an ATD.

Table 16

Control Over Selection of AT for Purchase

	n	%
None	5	33%
Slight	1	7%
Moderate	2	13%
Considerable	4	27%
I make the final decision	2	13%

Respondents were asked to assess the extent to which money was a factor in the acquisition or use of an ATD. About half of the respondents (n=7; 47%) stated that money was a major barrier. Two respondents (13%) felt money could often be a barrier, while others felt money was not normally a barrier (n=1; 7%) or was not a barrier (n=2; 13%).

Respondents were also asked if there was an ATD that they needed but currently were not able to buy. Seven respondents (47%) did not want an ATD they could not buy; compared to six respondents (40%) who thought the opposite, that there was an ATD they needed but could not buy.

Respondents were asked to identify various sources of payment for ATDs and services. Of the 12 respondents who answered this question, the two sources most frequently cited were VR services (n=7; 58%) and Medicaid (n=5; 42%). Responses also included out of one's own pocket (n=3; 25%), family or friends (n=2; 17%), Indian Health Service (n=2; 17%), Medicare (n=1; 8%), state funds (n=1; 8%), Social Security

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Disability (n=1; 8%), and grant funds (n=1; 8%). Respondents were asked whether or not the costs of repairing, maintaining, and modifying ATDs was affordable and whether or not there was a limit to how much money they could spend on repairs. Although six respondents (40%) thought that such costs were affordable and four (27%) did not, seven respondents (47%) reported that there was a limit to how much they could spend on repairs.

Respondents were asked if they would use a low-interest loan or flexible loan program to purchase AT devices and services. Responses were evenly split, with five individuals (33%) saying they would use such a low-interest loan or flexible loan program and five respondents (33%) reporting that they would not.

AT in American Indian Culture

In the last section of the questionnaire, respondents were asked if there were any traditional Native methods or techniques that helped them deal with their AT needs. The majority of respondents stated that there were no such methods or techniques (n=8; 53%). Two other respondents were unaware of traditional Native techniques and methods (n=2; 13%). One respondent (7%) stated that praying for strength helped in coping with AT needs.

Respondents were asked to identify risks associated with using AT devices. Risks identified included physiological pain (e.g., pressure sores [n=1; 7%], broken bones [n=1; 7%]), and social problems (n=1; 7%). For instance, one respondent thought that by using ATDs she or he would no longer associate with other individuals who have disabilities. Another respondent stated that "you can't DonJoy [i.e., use DonJoy knee brace] when you are hurting," and one individual felt that using an AT telephonic device increased the risk of losing calls.

Regarding how AT could help respondents find a job or be promoted in their current job, respondents described the following benefits of AT:

- *With a faster computer, I would be able to get more accomplished.*

- *I [would not] spend too much time waiting.*
- *It would allow me to get where I need to on time.*
- *Lower risks of injury.*
- *Fewer missed appointments.*
- *Tape recorder helps me remember things.*
- *A "lite writer" [i.e. LightWRITER$_{tm}$] would allow me to communicate with others.*
- *I have to have my brace to work.*
- *It gives me control and capabilities to do a better job.*
- *If I had a computer it would help me in becoming more knowledgeable in working with a computer therefore I'll have a better chance at finding a job.*
- *I would request assistive technology service because it would help with my schoolwork.*

The consensus was that having ATDs would contribute both to improving employment outcomes and to allowing fuller participation in life. To the question of whether or not respondents had doubts about using ATDs, only one respondent identified such concerns. The respondent stated, "I have doubts about public reaction to my use of a "lite writer" [i.e. LightWRITER$_{tm}$] as a source of communication" and "I do not want prosthesis for arms; I had them before and I did not like them."

Results from the On-line AT Courses

Eight of the initial group of 10 students in UAP 505 experienced significant difficulty accessing the on-line course on a regular basis. Many individuals in tribal VR agencies reported that the server they used (located at a local community college) to contact the NAU on-line course was frequently down. In some instances the server could establish a connection but was not able to sustain it for any length of time, hampering

students' ability to complete the course content. As a result, affected students were given an incomplete grade for the semester, and the timeline for completing the course was extended through the Spring 2000 semester. The two students who were able to complete the course submitted a course evaluation during the first quarter of 2000. This course evaluation was used to identify areas in which to improve the course. For those students who were not able to complete the course because their Internet connections were unstable, Dr. Gallagher, the instructor, worked with the computer coordinator at the community college(s) to identify the sources of the technical problems and to correct them so that students could complete their coursework.

Regarding the media and technology used to take the two courses, the participants used their home computers, work computers, or, more commonly, the computers available at local community colleges. When asked to identify the problems they faced in attending the course, several students indicated that they had considerable problems using computers to take this course. Problems that the participants of the two courses listed included: 1) lack of access to computers, 2) inconvenient access, 3) computers that were not always available during the dates and times the student was able to work on the course, 4) servers that were down for a considerable amount of time, 5) the Internet was an unfamiliar tool and required a lot of time to learn to use for course content, 6) limited computer skills, and 7) time. The last factor related to the need to take the course outside of work hours. In all cases, students were not given time to complete coursework during typical working hours.

In terms of the outcome of the course, students rated the content as "interesting" and "beneficial." Some students stated that the course immediately assisted them in working with children and adults who were in need of AT devices or services. The course required that students complete activities to document their mastery of the content; the students stated that this activity-based instructional format was preferable to typical classroom learning formats. Finally, students completing the course gained an overview of relevant AT for persons with various disabilities.

UAP 505 evolved to ESE 599, and subsequently has been institutionalized as ETC 548, "Assistive Technology," which is part of the NAU Masters of Education in Educational Technology. ETC 548 will be offered once a year in a Web-based format. Anyone interested in taking the course, regardless of the individual's area of residence, can register and complete the course by contacting Dr. Larry Gallagher at (928) 523-5083.

DISCUSSION and CONCLUSIONS

Our review of a series of AIRRTC community-based needs assessments established a number of factors, for example, that consumer concerns about the availability and affordability of assistive technology devices were of major importance in some, but not all, of the communities studied. By far the most common assistive devices *used* by the urban American Indians and Alaska Natives in available study samples, were eyeglasses and various kinds of orthopedic aids. This finding was also supported by the analysis of data from the National Health Interview Survey (NHIS), which identified mobility aids and braces as the most common assistive devices. Furthermore, many of the respondents reported that they *needed* either eyeglasses or improved eyeglasses. Devices for hearing impairments, such as hearing aids, were used much less frequently.

The AIRRTC analysis of NHIS data found that, relative to the White population, American Indians and Alaska Natives were under-utilizing hearing aids. In fact, whether the respondents were asked about assistive devices, impairments, or activity limitations, it was found that eyeglasses, vision impairments, and limitations in seeing or reading were about twice as common as hearing aids, hearing impairments, and limitations in hearing. Although this elevated frequency of indicators of visual problems may be connected with the high rate of diabetes and corresponding vision-related sequelae, the difference in the rates of sensory impairments may be explained, in part, by the under-utilization of hearing aids, as suggested by analysis of NHIS data. It may be that American Indians (and other minorities) are not receiving enough information about the availability of hearing impairment services and devices. However, none of the 15 respondents to the current

AIRRTC survey indicated that they needed but could not get hearing aids and other hearing devices; only one respondent (7%) used a hearing aid.

While for American Indians and Alaska Natives the digital divide is a barrier to accessing the Internet and its myriad sources of information and communication, they have learned to compensate, to some extent, by gaining access to the Internet via computers at school, in public libraries, or in the homes of their friends. Once on the Internet, they used it to search classified ads, take courses, and access government reports at higher rates than people in other ethnic groups or races.

Our research design called for testing hypotheses with four kinds of data: the national RSA-911 case data, the National Health Interview Survey, the survey data collected for this project, and feedback from the students in the Internet courses. Unfortunately, the survey was not as widely distributed as we had hoped and the return rate was disappointing. Time was limited, and the project could not implement a number of response-enhancing strategies. Consequently, the sample and findings from the survey may be used for preliminary exploratory purposes.

Rate of Receiving AT Services and Devices

Data from the 1998 RSA-911 database supported the hypothesis that American Indians and Alaska Natives participating in the VR programs do not use AT services at the same rate as other racial or ethnic groups. American Indians and Alaska Natives used ATDs at lower rates than Whites and Asians/Pacific Islanders but at the same rate as Blacks, and received AT services at lower rates than all the other races (see Table 1). The RSA-911 database consists of case records from RSA services delivered in a given year. As such, it is not necessarily representative of the entire population of people with disabilities, nor is it even necessarily a representative sample of the population receiving services, because some individuals with disabilities may not apply for services and these application rates may vary to an unknown degree from one disability to another. In addition, the RSA-911 database does not include data from the tribal VR programs, and therefore does not apply to them.

Data from the 1994-95 National Health Interview Survey also supported the hypothesis that American Indians and Alaska Natives nationwide do not use AT services [and ATDs] at the same rate as other racial or ethnic groups (see Table 2). Compared to other racial or ethnic groups with respect to use of hearing aids, mobility aids, and braces, American Indians and Alaska Natives used hearing aids at a lower rate than Whites. Otherwise, their usage rate for those devices was either higher than that of other races or ethnic groups or not statistically different from it.

Assistive technology cannot be provided in Indian Country in isolation from other factors in the lives of people with disabilities. The operation of most high-tech ATDs depends upon the existence of other factors such as the availability of energy sources, telephone lines, and maintenance services. Opting to use AT without those prerequisites being met may in fact jeopardize the safety and health of the user.

Barriers to Receiving AT Services and Devices

The analysis of RSA-911 data supported our first hypothesis, that American Indians who are receiving other employment services do not receive AT at the same rate as other races or ethnic groups. Specifically, the RSA data showed that they received AT services less frequently than any other race, and that they used ATDs less frequently than any other race except Blacks. However, this finding did not apply equally to all ATD usage; for example, American Indians and Alaska Natives actually used mobility aids and braces more often than other races. They used hearing aids less often than Whites but more often than Blacks, or Asians and Pacific Islanders.

Our survey of consumers helped to identify other barriers, although with such a small sample these results are highly tentative. Some of the barriers identified were the lack of opportunity to obtain devices or services on credit (Table 14); AT help with work and work training and with "getting around" (Table 15); control over the selection of AT for purchase (Table 16); and money (see previous section, *Analysis of Funding for AT Devices*.). Lack of control over the selection of AT for purchase is an important issue because it may be a significant predictor of ultimate abandonment of the device.

Recently Enders and Spas (2000) wrote about the disadvantage rural consumers have with respect to the digital divide. From the large distances that consumers had to cover for repair and maintenance of their ATDs to the expensive character of AT services in general, respondents to the AIRRTC survey recognized that socioeconomic factors, with money at the top of the list, compromised the affordability and availability of AT to American Indians with disabilities. The on-line course helped identify other barriers, mainly related to digital divide issues, such as difficulties with Internet access (e.g., server frequently down or unreliable); lack of access to computers; and lack of familiarity with how to use computers and the Internet effectively. These issues are of special concern in the context of reports that the Bush administration may cut funding for digital divide programs (Bridis, 2001). One indication of this de-emphasis is the fact that as of June, 2001, the official government website on the digital divide, http://digitaldivide.gov/ contained no references to press releases, events, speeches, or newsletters since the Bush administration took office.

Comparison of Results with Other Studies

Two sets of questions in our survey (Appendix A, Section B, B-19 & B-20) were constructed to facilitate comparison of responses with the findings of Parette and VanBiervliet's (1990) study on physical disability and technology needs. The results from comparable questions in our survey are presented in Tables 15 and 16. In this comparison, it must be remembered that Parette and VanBiervliet surveyed the general population, with an unknown number of American Indian or Alaska Native respondents. Also, their survey focused on persons with physical disabilities, whereas in the AIRRTC survey there was a greater variety of disabilities represented, including, among others, substance abuse and anxiety (Table 3).

The results from Table 14 indicated that of the questions asked the greatest unmet need was for the opportunity to buy assistive devices or services on a "buy-on-time" or credit plan. Five of the 15 respondents (33%) thought this would be helpful, although only one of the respondents (7%) actually had this opportunity. In Parette and

VanBiervliet's (1990, p. 6) survey, 37% had this opportunity and 25% thought it would be helpful. This confirms the finding in the literature review that the availability of financial assistance as well as the availability and affordability of assistive devices are issues for American Indians and Alaska Natives with disabilities (Schacht, 1996; Schacht & Gallagher, 1999).

One somewhat unexpected finding from Table 14 was that most of our respondents (67%) were receiving transportation services, compared with 34% in Parette and VanBiervliet's (1990) survey. This finding probably relates to the fact that ours was not a representative sample of American Indians and Alaska Natives with disabilities, for whom transportation has often been a major problem not only in remote rural areas but in the cities as well (e.g., Schacht, Vanderbilt, & White, 2000, Table 11).

Areas of AT needs of consumers with respect to certain tasks were summarized in Table 15 (based on responses to questions in Appendix A, Section B-20). In a tabular format, consumers were asked "Do you use assistive technology to help you with..." and then, for each item, "Do you need this device or service, but you can't get it?" The service most needed that the respondents were unable to get was "Work and work training" (27%), compared with the 17% who identified this need in the Parette and VanBiervliet (1990) survey. The same percentage of respondents (27%) identified "Getting around" as one of the most needed services, compared with Parette and VanBiervliet's 13%. Evidently "Getting around" means something different from transportation services, which most respondents were already receiving. One of the surprises concerned computer accessibility. In the AIRRTC survey, only two respondents (13%) identified this as a service that they wanted but could not get, compared with 24% in Parette and VanBiervliet's survey. In view of information about the digital divide, this may again reflect the fact that our respondents were not a representative sample of American Indians and Alaska Natives with disabilities. It may be that our selection process was biased in favor of respondents who already had computer access—six respondents (40%) indicated that they used a computer. Perhaps in a similar vein, only one respondent (7%) identified the telephone as a needed but unobtainable service compared with Parette and

VanBiervliet's 17%. This was unexpected, since American Indians and Alaska Natives are much less likely than other races to have a telephone.

Conclusions

Since the need for AT training has been consistently identified as a high priority activity in the professional literature on special education and rehabilitation, many states are seeking ways to deliver AT training content to broad audiences of trainees. Often these individuals are geographically dispersed necessitating non-traditional training delivery methods. Many states have sought to develop structured AT training programs that cover the range of content that professionals will need in order to provide AT devices and services to the individuals they serve.

This project used the Internet to provide an overview of training information to persons located throughout Arizona and was innovative in utilizing feedback and evaluations from an NAU course as part of an AIRRTC research project. Specifically, the UAP 505 course sought service providers of American Indians with disabilities as a focus training group. The course was not only taught as one among other courses in the NAU Educational Technology program, but it has also now become part of the curriculum for the Masters of Education in Educational Technology.

AIRRTC researchers examined data regarding AT from several large national databases and conducted a survey of American Indians with AT needs. We were able to support the hypothesis that American Indians and Alaska Natives are not receiving AT services or using AT devices at the same rate as other races. We were also able to support the hypothesis that assistive devices such as hearing aids are underutilized by American Indians and Alaska Natives who need them. In addition, we found support for the hypothesis that socioeconomic factors and financial barriers compromise the availability and affordability of AT services and devices to American Indians with disabilities.

We had unexpected difficulties in identifying American Indians and Alaska Natives with AT needs to participate in our survey. Since we depended on VR counselors and the staff of projects associated with the Assistive Technology Act of 1988 (in the 14

states with more than 50,000 American Indians or Alaska Natives) to help us identify potential participants in our survey, either our implementation of the research design was flawed or the VR counselors and the staff of the "Tech Act" projects did not have good contacts with this consumer population. One of the major limitations of our survey was the small number of respondents.

This has been only a preliminary study into the AT needs of American Indians and Alaska Natives. Clearly, much work needs to be done in this area. Accordingly, we have formulated a number of recommendations.

Recommendations

Based on the results of our study, several recommendations are in order:

1. Annual analysis of RSA-911 data to monitor trends in the use of AT services and devices by American Indians and Alaska Natives, expanded to include the effectiveness of those services as measured by Closure Status.
2. Training for VR counselors regarding screening and referral for hearing impairments. This might include providing clients and their families with information about the availability of services and devices for people with hearing impairment. If hearing aids are provided, counselors need to ensure (in Native language as appropriate) that the audiologist will provide clear instructions on the use and maintenance of hearing aids, such as what to do when the hearing aid does not seem to work (e.g., how to check battery and replace battery, how to keep air channel open and clean out any earwax).
3. Training for VR counselors about how to consider AT for their clients, given the resources available in the client's setting.
4. Training for VR counselors on researching for comparable benefits for AT, including purchase in a timely fashion with a warranty, preferably with a local vendor.

5. Training for tribal VR counselors in how to bridge the digital divide in order to provide more effective AT services and devices to their consumers. This training would include general information about how to use computers and the Internet, and also how to use the Internet to find out about products and services their clients need. The training would also include information about AT and how to help their clients obtain, maintain, and repair the most common AT devices and services, such as mobility aids, hearing aids, and braces.

6. Advocacy efforts are needed with Tech Act projects and Independent Living Centers to increase their awareness of the AT needs of American Indians and Alaska Natives with disabilities.

We also became aware of a number of areas where future research is needed:

1. Follow-up research is needed on why 27% of the survey respondents were unable to get AT devices and services for "work and work training" when they needed it. These respondents were probably more likely than most American Indians and Alaska Natives to have received VR services, so why was "work and work training" an unmet need, to a greater extent than in Parette and VanBiervliet's (1990) survey? Similarly, follow-up research is needed on what the "getting around" services were that they could not obtain.

2. A comparison of our results with data about American Indians and Alaska Natives in other databases based on probability sampling is needed, in order to obtain more reliable information about rates of use of AT services and devices by American Indians and Alaska Natives.

3. A larger follow-up survey with a sample size of more than 100 respondents is needed in order to obtain a better assessment of the AT needs of American Indians and Alaska Natives.

4. A survey of counselors in Independent Living Centers, Tech Act, and state and tribal VR programs that serve American Indians and Alaska Natives who use or need AT services or devices is needed to determine their degree of

awareness about the AT needs of these consumers and the extent to which they are providing the needed services.

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Appendix A

Questionnaire

Accessing Assistive Technology Devices and Services

Questionnaire

Assistive technology devices help individuals with disabilities and those who are aging in their daily lives—at work, recreational or leisure activities, home, and school. Some familiar examples include wheelchairs, hearing aids and calculators, ramps, and air filters and jar openers. Other devices are less common such as computers, speech aids, adapted toys, car or van modifications, and industrial-style respirators.

Assistive technology services help people obtain and use the products they need. Such services include assessment of what is needed, finding out what is available, trying out the devices, getting help paying for devices, and repairing them if they break. (ADA)

This survey is being conducted to determine the knowledge and availability of assistive technology (AT) for *American Indians and Alaska Natives with disabilities*.

An individual is defined as having *a disability* if s/he (a) has a physical or mental impairment that substantially limits one or more of the major life activities; (b) has a record of such impairment; or (c) is regarded as having such impairment. (ADA)

A *physical* or *mental impairment* causes some part of the body (heart, muscles, brain, and eyes) or body system (breathing, hearing, digestion, and nervous system) to not work properly. A person can be born with an impairment (e.g., cerebral palsy or a missing arm) or can become impaired sometime during his/her life by illness (e.g., diabetes, stroke) or injury (e.g., broken bones, spinal cord injury). Mental impairments affect learning, behavior, and emotions (e.g., mental retardation, mental illness, and specific learning disabilities). (Adapted from ADA)

Please check the category that best describes the person completing this form: (Note: To the extent that the consumer can complete the questionnaire by her/himself, or with the help of a family member or friend, it would be preferable that the service provider does not assist her/him)

_____ Person with a disability

_____ Person with a disability assisted by a family member or friend

_____ Person with a disability assisted by service provider:

_____

(Type of service)

The questionnaire should take you about an hour to answer.

SECTION A: Information about the Person with a Disability

NOTE: In the following questions "you" refers to the individual with a disability.

A-1 Do you live on a reservation?

O Yes, if yes, which reservation? _____

O No, if no, where do you live:

- ❒ In a very large city of 50,000 & up?
- ❒ In a city of 5,000 – 50,000?
- ❒ In a town of less than 5,000?
- ❒ On a farm or in open country?

A-2. What state do you live in? _____

A-3. What year were you born? _____

A-4. Gender: O Female O Male

A-5. Race/Ethnicity: (*Check all that apply*)

- O African American
- O American Indian /Alaska Native
- O Asian/Pacific Islander
- O Other: _____
- O Caucasian
- O Hispanic
- O Middle Eastern

A-6. Do you have a tribal affiliation?

- O No
- O Yes (If yes, which one? _____

A-7. What language/sign language do you speak most often at home?

_____

A-8. Do you have any of the following disabilities, impairments, or chronic illnesses? (*Check all that apply*)

- O ADD/ADHD
- O Amputation
- O Anxiety
- O Arthritis
- O Autism
- O Behavioral health
- O Bipolar disorder
- O Blindness
- O Cancer
- O Cerebral palsy
- O Chemical sensitivity
- O Kidney disorder
- O Low blood pressure
- O Lung disorder
- O Mental retardation
- O Multiple sclerosis
- O Muscular disease (e.g., Muscular dystrophy)
- O Neurological impairment
- O Obesity
- O Orthopedic disorder
- O Personality disorder
- O Schizophrenia

A-8. ***Continued***

Do you have any of the following disabilities, impairments, or chronic illnesses?

(*Check all that apply*)

- ❍ Chronic depression
- ❍ Deaf
- ❍ Developmental delay/disability
- ❍ Diabetes
- ❍ Epilepsy (seizures)
- ❍ Fetal alcohol syndrome
- ❍ Hard of hearing
- ❍ Heart problems
- ❍ Hypertension (high blood pressure)
- ❍ Severe mental illness
- ❍ Specific learning disability
- ❍ Speech/language disorder
- ❍ Spinal cord disorder
- ❍ Stroke
- ❍ Substance abuse (incl. alcohol, glue, street drugs)
- ❍ Traumatic brain injury
- ❍ Visual impairment
- ❍ Other: _____

A-9. Housing—where do you live?

- ❍ Your own home
- ❍ Your parents' home
- ❍ Apartment
- ❍ Section 8 Housing
- ❍ Rental home
- ❍ Your relative's home
- ❍ Nursing home
- ❍ Other: _____
- ❍ Group home
- ❍ Your friend's home
- ❍ Homeless

A-10. Housing—Utilities: (check yes or no)

Do you have electricity in your home? ❍ Yes ❍ No

Do you have running water in your home? ❍ Yes ❍ No

Do you have a telephone in your home? ❍ Yes ❍ No

A-11. What is the average number of hours that someone helps you (paid or unpaid) in activities of daily living in each 24-hour day?

- ○ Unpaid relative: _____ hours per day
- ○ Hired/paid person: _____ hours per day
- ○ No assistance required

A-12. What is the highest level of formal education you have obtained? (*Check one*)

- ○ 8th grade or less
- ○ Some high school
- ○ High school graduate or G.E.D.
- ○ Post-secondary school other than college
- ○ Some college
- ○ College degree
- ○ Some graduate school
- ○ Graduate degree

A-13. Are you presently employed? *(Check one)*

- ○ No, seeking employment
- ○ No, not seeking employment (Why? _____)
- ○ Yes, employed full-time (30 hours or more a week)
- ○ Yes, employed part-time
- ○ Yes, employed not for pay: unpaid family worker
- ○ Yes, employed not for pay: homemaker
- ○ Yes, employed not for pay: sheltered workshop
- ○ Yes, in supported employment
- ○ Yes, self-employed

A-14. Are you receiving any employment services? (Check all that apply)

- ○ No
- ○ Yes, Job Training Partnership Act/Workforce Investment Act
- ○ Yes, Temporary Assistance for Needy Families (Welfare To Work)
- ○ Yes, Vocational Rehabilitation
- ○ Yes, Other (specify): _____

A-15. What are your monthly earnings from all sources of income?

○ $0 - $150	○ $600 - $750	○ $1,300 - $1,600
○ $150 - $300	○ $750-$900	○ $1,600 - $1,900
○ $300 - $450	○ $900-$1,050	○ $1,900 - $2,500
○ $450 - $600	○ $1,050 - $1,300	○ $2,500 - $4,000

○ more than $4,000

SECTION B: Information about the Assistive Technology Needs of the Person with a Disability.

B-1. To complete this section, you may find it helpful to read through the entire list (a-n) of assistive technology devices first to see how the devices are categorized and then return to start writing your answers.

a. <u>Aids for daily living</u>: Self-help aids for use in activities such as eating, bathing, cooking, dressing, toileting and home maintenance.

1. How many assistive devices of this kind do you currently have? _____
2. What device(s) do you have? _____

_____

_____

3. Do you still use the device(s)?

   ❍ Yes Please identify device(s): _____

   ❍ No Please identify device(s): _____

4. If not, why not? _____

b. <u>Environmental controls</u>: Primary electronic switches or systems that enable a person without mobility to control appliances, electronic aid, lights, telephones, security systems, etc. in a room, home or other surroundings.

1. How many assistive devices of this kind do you currently have? _____
2. What device(s) do you have? _____

   _____

3. Do you still use the device(s)?

   ❍ Yes Please identify device(s): _____

   ❍ No Please identify device(s): _____

4. If not, why not? _____

c. <u>Ambulation aids</u>: Devices that help people walk upright, including canes, crutches, or walkers.

1. How many assistive devices of this kind do you currently have? _____
2. What device(s) do you have? _____

   _____

3. Do you still use the device(s)?

   ❍ Yes Please identify device(s): _____

   ❍ No Please identify device(s): _____

4. If not, why not? _____

d. Seating and positioning aids: Modifications to wheelchairs or other seating systems that provide greater body stability, upright posture or reduction of pressure on the skin surface, such as wheelchair cushions, trunk/head supports, modular seating and seat lifts.

1. How many assistive devices of this kind do you currently have? _____

2. What device(s) do you have? _____

   _____

3. Do you still use the device(s)?

   O Yes Please identify device(s): _____

   O No Please identify device(s): _____

4. If not, why not? _____

e. Prosthetics and orthotics: Devices (i.e., braces and artificial limbs, which replace and/or augment missing or non-functioning body parts).

1. How many assistive devices of this kind do you currently have? _____
2. What device(s) do you have? _____

   _____

3. Do you still use the device(s)?

   O Yes Please identify device(s): _____

   O No Please identify device(s): _____

4. If not, why not? _____

f. Architectural items: Structural adaptations to the home or worksite that remove or reduce physical barriers. Items include ramps and elevator lifts, as well as minor physical adaptations such as replacing doorknobs with levers or grab bars in bathrooms.

1. How many assistive devices of this kind do you currently have? _____
2. What device(s) do you have? _____

   _____

3. Do you still use the device(s)?

   ❍ Yes Please identify device(s): _____

   ❍ No Please identify device(s): _____

4. If not, why not? _____

g. <u>Transportation aids</u>: Items that enable independence in personal transportation, such as adapted cars and vans, child restraint systems, and modifications to ensure vehicle access.

1. How many assistive devices of this kind do you currently have? _____
2. What device(s) do you have? _____

   _____

3. Do you still use the device(s)?

   ❍ Yes Please identify device(s): _____

   ❍ No Please identify device(s): _____

4. If not, why not? _____

h. <u>Mobility aids</u>: Devices that allow freer movement, including transfer aids and patient lifts as well as all types of wheelchairs and three-wheeled vehicles.

1. How many assistive devices of this kind do you currently have? _____
2. What device(s) do you have? _____

   _____

3. Do you still use the device(s)?

   ❍ Yes Please identify device(s): _____

   ❍ No Please identify device(s): _____

4. If not, why not? _____

i. Bed aids: Devices that make bedroom functioning easier, including manual and electronic beds, side rails, and transfer equipment.

1. How many assistive devices of this kind do you currently have? _____
2. What device(s) do you have? _____

   _____
3. Do you still use the device(s)?
   - ○ Yes Please identify device(s): _____
   - ○ No Please identify device(s): _____
4. If not, why not? _____

j. Sensory aids: Equipment for people with vision or hearing disabilities. Devices include hearing aids, eyeglasses and other low-vision aids, reading devices (e.g., reading stand, page-turner, easel, magnifiers, signal strobe, vibrating alarm clock)

1. How many assistive devices of this kind do you currently have? _____
2. What device(s) do you have? _____

   _____
3. Do you still use the device(s)?
   - ○ Yes Please identify device(s): _____
   - ○ No Please identify device(s): _____
4. If not, why not? _____

k. Communication aids: Aids for people with communication impairments. Devices include augmentative communication devices and prosthetics, manual and electric picture boards, TTY/TDD, voice over phone, and volume controlled telephone system.

1. How many assistive devices of this kind do you currently have? _____
2. What device(s) do you have? _____

   _____

3. Do you still use the device(s)?

   ○ Yes Please identify device(s): _____

   ○ No Please identify device(s): _____

4. If not, why not? _____

l. <u>Education/vocational aids</u>: Equipment that enables people with disabilities to carry out school- or work-related tasks. Tape recorders, computers, adaptive software and job modifications are included.

1. How many assistive devices of this kind do you currently have? _____
2. What device(s) do you have? _____

   _____

3. Do you still use the device(s)?

   ○ Yes Please identify device(s): _____

   ○ No Please identify device(s): _____

4. If not, why not? _____

m. <u>Recreational aids</u>: Aids for adaptations to sports equipment (e.g., special shoes or bicycles) that enable people with functional limitations to participate in recreational activities.

1. How many assistive devices of this kind do you currently have?

   _____

2. What device(s) do you have? _____

   _____

3. Do you still use the device(s)?

   ○ Yes Please identify device(s): _____

   ○ No Please identify device(s): _____

4. If not, why not? _____

n. Other, please specify: _____

1. What device(s) do you have? _____

   _____

2. Do you still use the device(s)?

O Yes Please identify device(s): _____

O No Please identify device(s): _____

3. If not, why not? _____

B-2. Are you satisfied with your assistive technology devices?

O Very Satisfied O Somewhat satisfied O Not satisfied at all

If not satisfied, please specify which device(s) and why: _____

_____

B-3. Does your assistive technology device use electric power?

O No

O Yes, battery power

O Yes, home use powered by local sources of electricity (e.g., generator-powered, solar, or wind-powered electricity, etc.)

O Yes, home use powered by public utility

B-4. List the assistive technology device you do not currently have, but feel is necessary for you or would help you to do things more easily or independently: _

_____

B-5. How often do you use assistive technology devices in the following environments?

1. **Home:**

O Never

O Once a month or less

O Two or three times a month

O One to two times a week

O Three to four times a week

O Five to six times a week

O Once a day

O More than once a day

2. **School:**

O	Never	O	Three to four times a week
O	Once a month or less	O	Five to six times a week
O	Two or three times a month	O	Once a day
O	One to two times a week	O	More than once a day

3. **Work:**

O	Never	O	Three to four times a week
O	Once a month or less	O	Five to six times a week
O	Two or three times a month	O	Once a day
O	One to two times a week	O	More than once a day

4. **Other, specify**: _____

O	Never	O	Three to four times a week
O	Once a month or less	O	Five to six times a week
O	Two or three times a month	O	Once a day
O	One to two times a week	O	More than once a day

B-6-a. What assistive technology service(s) that you need are <u>unavailable</u> to you in one of the following environments? (*<u>Check</u> all that apply*)

1. **<u>Information</u> about assistive technology is needed but not available at:**

   O home O school O work O other:_____

2. **<u>Assessment/evaluation</u> for a device is needed but not available at:**

   O home O school O work O other:_____

3. **<u>Acquisition</u> of a device is needed but not available at:**

   O home O school O work O other:_____

4. **<u>Training</u> in the use of a device is needed but not available at:**

   O home O school O work O other:_____

5. **Maintenance/repair of a device is needed but not available at:**

O home O school O work O other:_____

B-6-b. All services I need are available at:

O home O school O work O other:_____

B-7. What assistive technology service(s) have you received in the past year, if any? *(Check all that apply)*

- O Information about assistive technology
- O Assessment/evaluation for a device
- O Acquisition of a device
- O Training in the use of a device
- O Maintenance/repair of a device
- O I received no assistive technology services this past year

B-8. *Check* the statement that best describes your awareness of what assistive technology devices and services are available.

- O I am very knowledgeable about assistive technology devices and services.
- O I am aware of what devices and services are available to me.
- O I am somewhat aware but would like to know more.
- O I am generally unaware and need to know more.
- O I am unaware but am comfortable with that.

B-9. In the past year, have you read or heard about assistive technology from:

(*Check yes or no*)

a. Disability Organization	O Yes	O No
b. Family Members	O Yes	O No
c. Friends	O Yes	O No
d. Health Care Provider	O Yes	O No

e.	Newsletter	O Yes	O No
f.	Newspaper Advertisements	O Yes	O No
g.	Professional Association	O Yes	O No
h.	Radio	O Yes	O No
i.	School Program	O Yes	O No
j.	State Assistive Technology Program	O Yes	O No
k.	Training or Conferences	O Yes	O No
l.	TV Commercial	O Yes	O No
m.	Vendor	O Yes	O No
n.	Other, please specify _____		

B-10. Which of sources from the above list is your most important source of information on assistive technology? (*Write in the letter from the above list*)_____

B-11. Who provides assistive technology services to you? (***Check all that apply***)

O	Assistive Technology Specialist	O	Physical Therapist
O	Audiologist	O	Rehabilitation Engineer
O	Equipment Manufacturer Representative	O	Speech/Language Pathologist
O	Medical Equipment Supplier	O	Teacher
O	Occupational Therapist	O	Vocational Rehabilitation Counselor
O	Orthotist/Prosthetist	O	Other, please specify: _____

B-12. Who made your most useful or essential assistive technology device? Please specify:_____(type of device)

O	Myself	O	Equipment Manufacturer
O	Family Member	O	Assistive Technology Specialist
O	Friend	O	Rehabilitation Engineer
O	Other, please specify: _____		

B-13. Who repairs, maintains, or modifies your most useful or essential assistive technology device? Please specify:_____(type of device)

- O Myself
- O Family member
- O Friend
- O Equipment Manufacturer
- O Assistive Technology Specialist
- O Rehabilitation Engineer
- O Other, please specify: _____

B-14. Are you satisfied with the time that it takes to repair your

a. most useful or essential assistive technology device? Please specify:_____

_____ (type of device)

O Very satisfied O Somewhat satisfied O Not at all satisfied

b. Second most useful or essential assistive technology device? Specify:_____

_____(type of device)

O Very satisfied O Somewhat satisfied O Not at all satisfied

B-15. Is there a service that can come to your home for assistive technology repairs or do you need to send your device away or take it to a city? _____

_____

B-16. How long does it take you to travel to see an assistive technology service provider? _____ Hours

Please explain: _____

_____

_____

B-17. How often do you participate in activities outside of your home?

Social (please specify): _____

❍ Never (not at all) ❍ Once or twice a year ❍ Monthly

❍ Weekly ❍ Daily

Religious or spiritual (please specify): _____

❍ Never (not at all) ❍ Once or twice a year ❍ Monthly

❍ Weekly ❍ Daily

Work-related (please specify): _____

_____

❍ Never (not at all) ❍ Once or twice a year ❍ Monthly

❍ Weekly ❍ Daily

School-related (please specify): _____

_____

❍ Never (not at all) ❍ Once or twice a year ❍ Monthly

❍ Weekly ❍ Daily

Other activities (please specify which and how often):_____

_____

Is there something that prevents you from participating in those activities? (please specify activities and reasons for not participating): _____

B-18. Has assistive technology helped you find or maintain a job?

❍ Yes ❍ No

If yes, in what ways?

_____

B-19. Please tell us more about your assistive device(s): (Write in Y or N)

1. Were you given an evaluation before getting your assistive device? ____

   Would this be helpful? ____

2. Did you have the opportunity to buy assistive devices or services on a "buy-on-time," or credit plan? ____

   Would this be helpful? ____

3. Are transportation services being provided to you? ____

   Would this be helpful? ____

4. Have you received enough training in the use and care of your assistive device?

   _____

   Would this be helpful? ____

5. Were you able to try out the device before paying for it? ____

   Would this be helpful? ____

6. If employed, did your employer change your work area or equipment to meet your needs? ____

   Has this affected your ability to do your job? ____

7. Do you need more information about assistive devices or services that could help you? ____

8. Are you satisfied with the services you receive for the assistive devices that you use?

   O Very satisfied O Somewhat satisfied O Not at all satisfied

B-20. Assistive technology devices/services used and unmet needs

Do you use assistive technology to help you with: (*Check all that apply*)	Do you need this device or service, but you can't get it?
❍ Self-help	❍ Yes ❍ No
❍ Taking care of home	❍ Yes ❍ No
❍ Work and work training	❍ Yes ❍ No
❍ School training	❍ Yes ❍ No
❍ Getting around	❍ Yes ❍ No
❍ Specialized seating	❍ Yes ❍ No
❍ Using a telephone	❍ Yes ❍ No
❍ Talking with others	❍ Yes ❍ No
❍ Reading, writing and typing	❍ Yes ❍ No
❍ Recreation	❍ Yes ❍ No
❍ Things that help you see	❍ Yes ❍ No
❍ Hearing aids and other hearing devices	❍ Yes ❍ No
❍ Using a computer	❍ Yes ❍ No
❍ Building accessibility	❍ Yes ❍ No
❍ Artificial limbs, braces and prostheses	❍ Yes ❍ No
❍ Specialized cars, vans and buses	❍ Yes ❍ No

Other, specify:_____

SECTION C: Information about funding for the Assistive Technology device for the person with a disability.

C-1. How much control do you have over the selection of assistive technology for purchase? *(Check one)*

- O None
- O Slight
- O Moderate
- O Considerable
- O I make the final decision

C-2. To what extent is money a factor in your acquiring or using assistive technology? (*Check one*)

- O Money is not a barrier
- O Money is not usually a barrier
- O Money can often be a barrier
- O Money is a major barrier

Comments: _____

C-3. Is there a money limit to how much you can spend on an assistive technology device? O Yes O No

What is the limit amount of dollars you can spend on an assistive technology device?

$_____

C-4. Is there an assistive technology device you need but currently are not able to buy? O Yes O No

What is it? _____

C-5. Source of payment of assistive technology devices and services: ***(Check all that apply)***

- O Bank or credit card loans
- O Family or friends
- O Independent Living Center/Program
- O Medicaid
- O Medical assistance/waiver program
- O Medicare
- O Out of own pocket
- O Private insurance
- O School
- O Vocational rehabilitation
- O Other: _____

C-6. Is the cost of repairing, maintaining, and modifying your assistive technology device affordable? O Yes O No

Is there a money limit to how much you can spend on repairs? O Yes O No

What is the limit amount of dollars you can spend on repair? $ _____

C-7. Would you use a low-interest loan or flexible loan program to purchase assistive technology? O Yes O No

SECTION D: Assistive Technology in American Indian culture.

D-1. **Are there any Native traditional methods or techniques that help you deal with your assistive technology needs?** _____

_____

D-2. **Please describe any risks associated with using assistive technology.**

_____

_____

_____

D-3. **Please describe how assistive technology could help you find a job or be promoted in your current job.**

_____

_____

D-4. **Please describe any doubts you may have about assistive technology devices and services. For instance, are there instances when you would rather not use an assistive technology device or request assistive technology services in spite of your disability?**

_____

_____

_____

D-5. **When you think of the suppliers of assistive technology services and devices, and your experience with maintaining and repairing your assistive technology devices, have you had any experiences reflecting a lack of cultural sensitivity?**

O Yes O No

If yes, please describe: _____

_____

_____

_____

D-6. **Do you have any further comments?**

_____

_____

_____

_____

Appendix B

UAP 505

UAP 505 "Assistive Technology in the Lifespan: An Introduction"

INFORMATION ABOUT THE COURSE:

The Course:

"UAP 505 "Assistive Technology in the Lifespan: An Introduction"

Course offering dates:

September 20-December 16 (24 days)

Credits: 2 university credits

Course Fees:

$229.00 (Scholarships available from the American Indian Rehabilitation Research & Training Grant at Northern Arizona University).

Additional Registration Requirements:

You must be admitted to the Graduate or Undergraduate college ($10 or $40 fee respectively).

Registration Deadline: Friday, September 17, 1999.

Description of the Course:

This course is designed to provide individuals with an overview of the full range of assistive technology devices that can assist an individual in overcoming their functional limitations. Participants will be provided basic information about specific classes of AT devices, the potential applications of AT for persons with a variety of disabilities, assessment strategies, legislation, funding options, and current issues in delivering AT services. It is strongly recommended that students taking this course have a working knowledge various cognitive, physical, and sensory disabilities as these will not be covered in detail in this course.

Structure and Outline:

This course is divided into three main modules. Each module is thematic and covers an area of assistive technologies (for example, legislation and funding). Modules are further divided into one or more subtopics. The individual subtopics contain more detailed information about one particular area of assistive technology. Modules and topics are identified by a standard notation (e.g., 2-1, 3-2) where the first number refers to the module and the second number identifies the topic.

1 - Disabilities and Assistive Technology
1.1 - What is AT?
1.2 - Models of assessment and intervention
1.3 - AT services

2 - Assistive Technologies

2.1 - Seating & Positioning
2.2 - Access & Control
2.3 - Writing & Computer Access
2.4 - Communication
2.5 - Reading, Learning, & Math
2.6 - Vision
2.7 - Hearing
2.8 - Recreation & Leisure

3 - Policy & Funding

3.1 - AT - Related Law
3.2 - Funding Issues

To view the switches and controls topic, go to this address -

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